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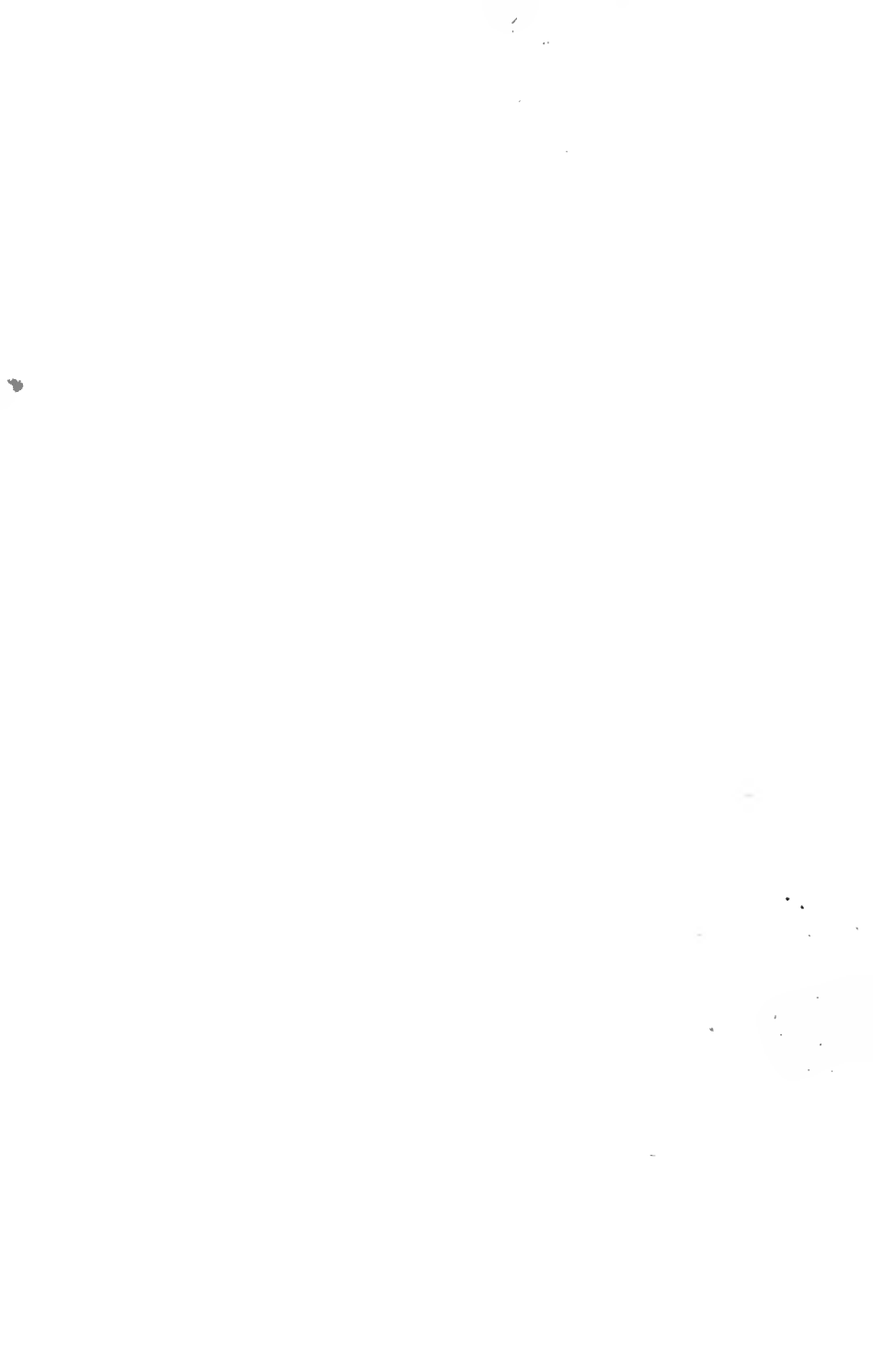
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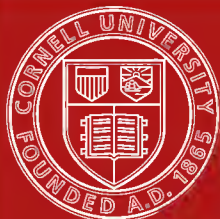
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THE
COMMONWEALTH OF GEORGIA.

THE COUNTRY; THE PEOPLE;
THE PRODUCTIONS.

PART I.—THE COUNTRY.

PREPARED UNDER THE DIRECTION OF
J. T. HENDERSON,
COMMISSIONER OF AGRICULTURE.

ATLANTA, GEORGIA:
JAS. P. HARRISON & Co., STATE PRINTERS.
1885.

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PREFACE.

The organic law establishing the Department of Agriculture for the State of Georgia provided for the preparation of a Hand-Book of the State. That volume was issued by the Department in 1876, and was so eagerly sought for as to exhaust the edition in a short time, and it is now out of print.

This demand for a work descriptive of Georgia and her resources is still pressing, and to such an extent as to make the publication of a new edition of the former Hand-Book, or an enlarged exposition of the Commonwealth in a different form, a necessity.

The Commissioner of Agriculture has attempted in the present work to depict, by a series of maps, and, it is hoped, in an intelligible and acceptable way, the Geology, the Agriculture, the Temperature and Rainfall, the Water-powers, the Forestry and the Minerals of the State, and has given a hypsometric map, showing the general elevation of the country. These maps have been regarded as most desirable illustrations of our State, and an earnest effort has been made to have them as accurate and full as possible.

It was deemed important in the scope and preparation of the present Hand-Book to give, with considerable detail, a description of the population, including, with its marked characteristics, an account of the public institutions of the State, State government, some of the laws of general application, the educational establishments, railroads, newspapers, etc. Information as regards these enumerated subjects, it would seem, would be acceptable to all who were not citizens of Georgia, and were interested in obtaining minute information in regard to her true standing among her sister commonwealths.

A cursory account is given in the present work of the fruit, grass, garden and field products of the State, with some examples of successful husbandry, proving the remunerative possibilities of our soil. While this enumeration and account does not pretend to

be exhaustive by any means, it will nevertheless convince any one informed on such matters that in the wide range of valuable staples, Georgia takes rank with the most highly favored States in our Union. It is not assuming any advantage, not clearly established by the history or natural capabilities or resources of Georgia, to claim for her a position second to no commonwealth embraced in the limits of this vast republic. In general productiveness, in salubrity of climate, in the incomparable blessing of good water, in facilities of transportation, in educational advantages, in the moral tone of her people, and the almost unbroken good order of society, what State of our day and generation can justly claim a happier condition or a higher civilization? For proof of all this, we refer the inquirer or the doubter to data furnished by the "Commonwealth of Georgia," as here presented.

ERRATA.

In the titles of maps of winter and annual rainfall following pages 38 and 64, for "isothyetal," read *isohyetal*.

On page 53, in 14th line from bottom, strike out "next is that between—"

In Legend of Agricultural map, following page 96, for "cherity," read *cherty*.

On page 126, in two lines at bottom, and on page 127, in 3d, 17th line from top, for "ocre," read ocher.

In marginal note, on page 159, for "U. S. Engineer Corps," read Civil Department of the U. S. Engineer Corps.

On page 285, in 18th line from top, for "have been," read *have not been*.



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THE COMMONWEALTH OF GEORGIA.

PART I.—THE COUNTRY.

CHAPTER I.

GENERAL CHARACTER OF GEORGIA.

THE elements which enter into the composition of a State are so numerous that, in order to understand its character as a whole, some *short cut* is needed. Perhaps no better compendious method is to be found than, dealing with a State as with an individual, to inquire into its general character and reputation among those who already know it. Judged by this standard, which is obviously fair, the character of Georgia among her sister States stands confessedly high. She is favorably known among her neighbors, and favorably regarded abroad. She has no inconsiderable influence in the councils of the nation, and very great influence in the councils of the South, the section of which she is a member. Among these especially her views and opinions in matters of Federal and State policy, are respected, and her example largely followed. Indeed, she has by general consent acquired the title of the Empire State of the South ; a title, however, which may perhaps hereafter need to be transferred to Texas. On this subject the Encyclopedia Britannica closes its article with the remark : “ Texas possibly excepted, no Southern State has a greater future than Georgia.”

The opinions thus formed could be put in evidence in a court of justice. They are the resultant of many factors and the conclusions of many observers. Georgia being the youngest daughter of England among the colonies, is also among the younger States west of her a Mother State, and so she visits much, and in turn is much visited ; even as Atlanta is a Gate city, so is Georgia largely a Gate

State. The Atlantic and Gulf slopes, both are hers. In the chain of travel between the emigrant and immigrant States of the South she is a connecting link; so in the resorts to Florida as a sanitarium, and to those in Southern Georgia, and indeed in Northern Georgia also, she is a link in the chain, when not its terminus. And thus the opportunities of mutual acquaintance are unusually good between Georgia and citizens of all States and sections.

It will be the object of some ensuing chapters to indicate the particulars which go to make up this general character. In the present chapter we will notice one general feature, which characterizes the State in many of its aspects.

Georgia is eminently and in almost every respect

A VARIETY STATE.

Varied as to country, people and productions; as to soil and climate; as to the people who inhabit it, white and black; as to industries and institutions; as to fruits and vegetables, and farm. garden and orchard products; as to resources, agricultural, mineral and manufacturing.

Its territory is large, with ample room for choice and selection. Its chief extent is from north to south; so the range of *latitude* is considerable; northward, from a nearly tropical southern boundary.

The range of *elevation* is also large, from tide-water by a gradual rise to bold mountains, with only stunted vegetation. Latitude and elevation thus help each other in supplying a remarkable range of climate and production.

The State is full of geological variety, with consequent variety of soils and minerals. In the census volume, entitled, "Cotton Production of the State of Georgia," the opening comment on the geological features of the State is this: "The geological formations represented in Georgia embrace the Metamorphic, the Palæozoic, the Triassic, Cretaceous, Tertiary, and Quaternary."

And all these are considerably mixed together. As the present treatment, however, is for the popular rather than the scientific reader, we may say that the geology embraces formations prior to the early forms of life, and from these all grades, to regions of which the witty remark was made to one who complained that his section

was not appreciated: "A fine country it may be, but God Almighty has not yet finished it."

Nor less varied is the population, extending from a peculiarly pure form of the Anglo-Saxon race, unsurpassed as a blood in the wide world, to the African, of various tribes, some of them of the better races, others descended from the Guinea negro, very low in the scale.

Between these extremes nearly all varieties are to be found, and yet with the State stamp upon them all. But to treat of the people—most important work of all—must be the task of later chapters.

Varied in like manner are the productions of the State, both natural and cultivated. From the magnolia, live-oak and palmetto of lower Georgia, we pass through a region of pine, and another of oak, hickory and poplar, to the chinquapin and chestnut of the mountains, on which grow also the well-known and well-named "oak orchards," the scrubbed oaks almost as hard as iron, bearing a close resemblance to apple trees.

The home of the orange, fig and banana at the south; of the choicest of peaches, melons and pears in the middle of the State; and of apples, cherries, berries, etc in the north.

Between the planting seasons, or the early vegetable seasons, of different sections, the range is so great that one would almost think time would run out, and a single season be insufficient to cover the range between the coast and the mountains.

Diversity of occupation also obtains liberally; cotton and corn, rice, sugar, truck farming, fruits, melons, even tea. There are mining industries in gold, iron and coal, quarries of granite and marble, and buhrstone. Scarcely any State surpasses Georgia in variety of minerals.

Manufacturing industries, great and small, are constantly growing in extent and variety; and of late years the small industries have been introduced, the best foundation for permanent prosperity; small industries in manufactures being like small farms in agriculture. The number of towns has also increased astonishingly. Cotton and wool factories, iron works, soap, brooms, buckets, fertilizers, watches, cutlery, etc., etc., are all in progress or budding.

The people are enterprising, self-reliant, shifty, not afraid; they

are plastic and not easily crushed. There is enterprise in many ways, in town and city, in railroads, in coming and going, in the press—witness, as a leading example, the *Constitution* newspaper.

Now, for these various statements, and many more that might be made, the specifications and details are to be given in short chapters or tracts on the various heads, for the easy use of those interested on one head or topic, or another. Say, one on the people, another on the products, one on the whites, another on the colored people, or on cotton or climate, or a sanitarium for invalids, and so on for each topic and each taste.

On the whole, we who live in Georgia think we have in Georgia an excellent patch and parcel of the earth's surface, very convenient for man's use and occupation, for the three great purposes of health, wealth, and society.

CHAPTER II.

A STRONG OUTLINE VIEW OF GEORGIA.

There are three main topics to be treated, viz.: The Country; the People, and the Productions.

1. THE COUNTRY.

SITUATION.

(a.) *Latitude*.—Georgia lies between 30 deg., 21 min. 39 sec. and 35 deg. North latitude. It is strictly a Southern State; for its Northern boundary 35 deg. is south of the lowest parallel of Europe, 36 deg.

(b.) *Longitude*.—The State lies between 80 deg. 50. min. 9 sec. and 85 deg. 44 min. west from Greenwich; between 3 deg. 47 min. 21 sec. and 8 deg. 42 min. west from Washington City. At sunrise in Georgia (6 A. M.), it is noon in Eastern France and Switzerland; sundown in Southwest China and Thibet; and midnight in the heart of the Pacific Ocean—say half-way between the Sandwich Islands and New Zealand.

(c.) *Position*.—In the United States, Georgia is in the Southeast corner of the Southeast section of the Union; except Florida it is the extreme Southeastern State. It lies just at the bend of the coast; the Atlantic and Gulf States form a grand arch of which Georgia is the key-stone.

BOUNDARIES.

Georgia is bounded on the North by Tennessee and North Carolina; on the East, by South Carolina and the Atlantic Ocean; on the South by Florida, and on the West, by Florida and Alabama.

The Northern boundary is the 35th parallel of North latitude extending from Nickajack to Ellicott's Rock. This line separates Georgia from Tennessee for $73\frac{1}{2}$ miles, and from North Carolina for $70\frac{1}{2}$ miles.

The Eastern boundary is the Savannah river, separating Georgia from South Carolina, running in a general course of about South 35 deg. East for about 247 miles; and then to the Atlantic coast, running about South 20 West about 120 miles.

The Southern boundary is partly the St. Mary's river, partly a line running 87 deg. 17 min. 22 sec. (average direction) nearly a parallel of latitude for 158 miles.

The Western boundary is partly the Chattahoochee river, average course about North 6 deg. West for about 150 miles; then leaving the river, the boundary runs North 9 deg. 30 min. West to the Tennessee line 146 miles.

FORM AND DIMENSIONS.

In form Georgia is massive and compact. Five lines suffice for a fair outline, and six for a close approximation; being a key-stone it is nearly such in form, wedge-shaped.

The greatest length is from North to South, about 320 miles, and the greatest breadth from East to West, about 254.

The Geographical centre of Georgia is about 20 miles Southeast of Macon, near Jeffersonville in Twiggs county. Near the same point is the centre of the colored population of the Union.

AREA.

The area of Georgia is 58,980 square miles; it is the ninth State in size in the Union, and the largest State east of the Mississippi.

TOPOGRAPHY.

Mountains.—The great Appalachian chain, (the breast-bone of the continent, the Rocky Mountains on the west being the back-bone,) forms by far the leading topographical feature of the long line of Atlantic States. In its relation to this great feature, Georgia has its entire northern boundary among mountain ranges extending beyond her limits into Alabama on the west and South Carolina on the east. No peak in Georgia is a mile high; Mt. Enotah in Towns county, the highest, being 4,796 feet. The most noted mountains are the Rabun Bald, Blood, Tray, Yonah, Grassy, Walker's, Lookout, and the Stone Mountain, the largest mass of solid granite in the world.

Ridges.—A great ridge runs from the St. Lawrence River through the Atlantic States to Cape Sable in Florida.

This ridge, of which the culminating points are mountains, passes almost centrally through Georgia. It is for three-fourths of its length the long irregular eastern edge of the great Mississippi basin.

A second great ridge separates the Mississippi valley from the Gulf slope. This, the southern edge of the Mississippi basin, also passes through Northern Georgia. The two ridges meet near the corner of Rabun, Towns and White counties.

At this critical point a man standing with an umbrella in a shower sheds the water so that one part reaches the Atlantic near Savannah; a second part the Gulf at Apalachicola, while a third enters the Gulf below New Orleans, having passed successively through the Hiwassee, the Tennessee, Ohio and Mississippi Rivers.

Water Sheds.—Georgia participates in three great basins, determined by the ridges just described. Of her surface there are in the Atlantic slope about 32,400 square miles; the Gulf slope about 25,730 square miles; the Mississippi valley about 850 square miles. Thus the drainage of about 54 per cent. of the surface is into the Atlantic.

Rivers.—On the Atlantic coast there is but one slope, and generally the rivers flow with a rough parallelism southeast to the ocean. In Georgia, which partakes of three great slopes, they run in all directions, southeast, southwest, west and north. In the Atlantic States generally they run as from the ridge of a roof. In Georgia as from the apex of a cone.

The rivers on the Atlantic coast lie generally rather on the west side of their basins, and the longest confluent streams are on the east side.

RIVER SYSTEM OF GEORGIA.

<i>Atlantic Slope</i> —				32,400
LENGTH.	HEAD OF NAVIGATION.	NAVIGABLE LENGTH.	BASIN AREA.	
Savannah 450	Augusta	250	4,000	
Ogeechee 200	Louisville	150	6,000	
Altamaha 70	—	70	14,104	

LENGTH	HEAD OF NAVIGATION.	NAVIGABLE LENGTH.	BASIN AREA.
Oconee 300	C. R. R. Bridge	340	4,500
Ocmulgee 300	Hawkinsville	340	6,000
Satilla	Burnt Fork	50	4,000
St. Mary's	Trader's Hill	50	500
<i>Gulf Slope—</i>			27,020
Flint 300	Albany	250	9,500
Ch'hoochee 450	Columbus	300	6,000
Coosa	Rome		6,020
Oostanaula		105	
Etowah			

The navigable length of the Altamaha is added to its confluents, the Oconee and Ocmulgee.

The estimates are only approximate.

Water powers abound, especially at the heads of navigation of the rivers, estimated in the aggregate at 4,000,000 horse power. This exceeds the entire amount in actual use in the Union for all manufacturing and milling purposes.

Coast.—The coast line runs south-west from Savannah to St. Marys—in a direct line about 123 miles; by shore line about 480.

Harbors.—Savannah and Brunswick have the principal harbors, and are the chief ports. Darien and St. Marys have also good harbors.

Sounds are numerous along the coast, affording excellent internal navigation.

Islands abound along the entire coast line.

The Okefinokee Swamp ("trembling earth") several hundred square miles in area, is more than 100 feet above tide water, and susceptible of drainage.

Natural Divisions.—These are three—Upper, Middle and Lower Georgia. Upper Georgia is mountainous; Middle Georgia an undulating country, with clay soil and oak and hickory forests; Southern or Lower Georgia is characterized by sandy surface soil and pine forests. These sections are often sub-divided for the sake of nicer discrimination.

Scenery.—The State abounds in fine and varied scenery—mountains, valleys and waterfalls. These are now accessible, and much visited and admired.

Among the noted views are those from Lookont, Pigeon and Stone Mountains, and from Yonah and Tray. Nacoochee is the most noted valley. Among the falls are Tallulah, the terrible, Toocoa, the beautiful, and the Estatoa, as yet little known but of surpassing beauty.

Geology.—The general geological features of the Atlantic slope, from the sea to the mountains, represent all the intermediate grades from the period of earliest life to lands yet unfinished. Of these manifold formations, Georgia cuts out a slice.

The lines of the State run across all topographical and geological divisions.

MINERALS.

The minerals, depending on the geology, are equally varied. Few States present so great a variety, embracing amongst others gold, iron, silver, copper, lead and manganese, granite, limestone, marble, sandstone, slate, buhrstone, soap-stone, mica, asbestos, kaolin and various precious stones; the diamond, ruby, amethyst and opal.

A list of the minerals is given in the Hand Book of Georgia, p. 30.

SOILS.

These, depending also on the geological formation, are equally varied and often so intermixed that the epithet "spotted" would apply. In the northwest the soil is composed of disintegrated lime stone, etc.; in the northeast of granite and like stones. In Middle Georgia are red clay and gray soils with potash. In Southern Georgia the better lands contain lime and marl. A region near Columbus is cretaceous. The fertility of the soil and its adaptation to production will be the subject of a future chapter.

CLIMATE.

The climate of Georgia is full of variety in its relations to health, comfort and production. Since for every three hundred feet of elevation there is a fall of one deg. in temperature, this cause would make a change in Georgia of about 16 deg. The difference of latitude, $4\frac{1}{2}$ deg., would occasion a difference of about 9 deg.

These two causes would effect a variation therefore of about 25 deg. The annual mean for the State is about 65.1 deg.—the summer mean about 79.7 deg. and the winter mean about 50.1 deg. In Northern Georgia the summer mean about 75.3 deg., the winter mean about 42.8 deg. In South Georgia the annual mean 67.7 deg., summer 81.3, winter 53.6. In Middle Georgia the annual mean 63.5, summer 79.2, winter 47.2.

The foregoing figures are derived from the records of the Department of Agriculture; and they rectify the usual statements of temperature based on imperfect data.

The mean temperature of Atlanta corresponds with that of Washington City, Louisville and St. Louis. The extremes are seldom as great as in the Northern cities and sun strokes are less frequent. On the whole, the range of choice in climate is very wide, from the invigorating climate of the mountains to the rather debilitating summer climate of the South, modified, however, by the sea breezes.

There are few climates superior for the year round to that of Middle Georgia. Southern Georgia supplies in winter a sanitarium for pulmonary diseases, and Northern Georgia in summer for malarial diseases and fever; indeed, for lung diseases also.

Inadequate provision is made against cold, in our homes, but the tendency is to improvement in this regard.

Our winter climate is such, as respects production, that foreigners say we have two annual crops. This fact is of great service in wintering stock.

Rainfall.—This varies in different sections of the State—and not in the way usually represented. The lowest reports indicate 39 inches, the highest 72. The average is about 50 inches. A full report will be given hereafter.

NATURAL PRODUCTS.

Forests.—There is timber abundant for all purposes, fuel and material for work, material for houses and ships, for fencing and furniture and tools, for use and ornament, for shade and fruit, for wagons, carriages and plows.

A large business is done in the exportation of lumber and also of turpentine and like products.

Pine, oak, hickory, walnut, the elm, ash and maple, magnolia and live oak abound in different sections. There are great advantages in the second growth pines which follow after cultivation.

In the hand book of Georgia (p. 110) a list of 230 woody plants is given.

Grasses.—A chapter will be devoted hereafter to the natural and the cultivated grasses of Georgia.

Fuller information on these subjects will be furnished in subsequent chapters.

EXTERNAL RELATIONS.

The more *distant* external relations of Georgia are involved in its situation on the earth's surface. The State, lying between the 30th and 35th parallels of *latitude*, occupies on the Western Continent the same belt with Asia Minor on the east. Hence no people read the Bible narratives and descriptions with more sympathy and clear understanding than do the Southern people.

At the summer solstice, on the southern border of Georgia, the sun lacks but 8 deg. of being vertical; and gives to this region a semi-tropical character. Even the most northern parallel of the State passes entirely south of Europe.

Tracing our *latitude* across the western continent, Georgia corresponds in part with South Carolina, Alabama, Mississippi, Louisiana, Texas, New Mexico, Arizona and California. Upper Georgia would lie on the same parallel with North Carolina, Arkansas and the Indian Territory.

Traced across the Eastern continent, we fall entirely below Europe, and embrace North Africa, viz.: the Barbary States, Morocco, Algiers, Tunis and Tripoli and the island of Cyprus. The same belt passing into Asia, embraces parts of Asia Minor, Persia, Afghanistan, upper Hindostan, Thibet, lower Tartary and China. The difference in the elevation of the North Star above the horizon in Northern as compared with Southern Georgia is quite obvious to the eye without instruments. One who goes as far south as Galveston or Cape Sable, or as far north as Boston or Montreal, is quite struck with the difference.

Of the Isothermal belt we shall speak when treating of climate.

A road to the Pacific coast not far from the thirty-second parallel would cross the continent with the least interruption (rising above

that parallel in parts to avoid mountains) passing from Savannah by Montgomery, Jackson, near Shreveport and Nashville, Tyler, Dallas, Fort Worth and El Paso to San Diego on the Pacific.

Savannah is nearly on the same parallel with Alexandria, Jerusalem, the Dead Sea, Lahore and Shanghai; Atlanta with Damascus and Nankin.

In *longitude*, Georgia, lying between meridians 81 and 86, is nearly one fourth of a full circle (a little less than a quadrant) west of Greenwich. The sun rising in Savannah at six, touches North America first at Cape Charles at about 9:45, reaches Washington at 11:08, the coast of Georgia at 11:24, and its western boundary at 11:44 a. m., nearly noon.

The whole State lies west of South America, on the most eastern meridian, first touching Cape Blanco. The sun has risen full on the most western point of South America when it first reaches Georgia.

Tracing our longitude, the central meridian of Georgia would pass through the Isthmus of Panama, Western Cuba, Florida, Tennessee, Kentucky, Ohio and Michigan, passing into West Canada near the junction of the three great lakes—Superior, Michigan and Huron.

Our *antipodes* would be about 1,000 miles west of South Australia.

The meridian of Atlanta passes near Panama, Tallahassee, Frankfort, Cincinnati, near the center of population of the United States and Lansing and the Straits of Mackinaw.

BLUE AND RED TIME IN GEORGIA.

All the railroads in Georgia use red time, except the Atlanta & Charlotte Air-Line road, which uses blue. Red, or Central time, corresponds with time on the 90th meridian; blue, with the 75th. The Savannah river is on the separating line, nearly between the two standards.

NEARER EXTERNAL RELATIONS OF GEORGIA.

Georgia, lying just at the terminus of the great Eastern chain of Mountains—the Appalachians—embraces the first easy gap for many hundreds of miles between the Mississippi Valley and the Atlantic. This gap is penetrated by the Western & Atlantic Railroad. The next convenient point of passage is Rabun Gap, in Northeast Georgia.

In addition to her own resources, Georgia lies convenient to South Carolina for phosphates and rice, to Florida, for oranges and early fruits and vegetables, and for her health resorts in winter; to Alabama, for coal, iron and marble; to Tennessee for the same, and for grain and hog products, horses, mules, etc.; and to North Carolina for summer resorts.

By rail she connects with all the Northwest, the Southwest, and Northeast. And into the latter, also, by steamboat lines and by sailing vessels. Her ports connect promptly also with the West Indies and South America.

ORIGINAL AREA.

The original area of Georgia, before the session of territory to the Federal Government, in 1802, was over 147,000 square miles. It included the greater portion of the present States of Alabama, and Mississippi—a princely territory, with rich natural resources. In addition to this, a correct location of the Northern boundary would have embraced within the limits of Georgia a narrow, but long strip of land, now contained in the States of North Carolina, Tennessee, Alabama and Mississippi. The original grant called for a line running West from “the most Northern branch or stream of the River Savannah.” This would have included in Georgia the Ducktown mines—(and perhaps the city of Chattanooga?)

Georgia would, with this territory, be the third State in the Union, only less in area than Texas and California.

Comparative Areas, and Density of Population.

	Area.	Pop. per sq. mile.
Texas.....	262,290	6.07
California.....	155,980	5.54
Nevada.....	109,760	.57
Oregon.....	96,500	1.85
Minnesota.....	79,205	9.86
Kansas.....	81,700	12.19
Nebraska.....	76,185	5.96
Missouri.....	68,735	31.55
Georgia.....	58,980	26.15
United States, omitting Alaska.....	2,970,000	17.29
The States.....	2,063,000	24.00

New England.....	62,003	65 00
Middle States (4).....	102,020	145.00
Germany	208,626	217 00
France	204,030	171.00
Great Britain and Ireland.....	121,751	277.00
Japan.....	146,568	236.00

Elevation Above Sea-Level.

In the census report of 1880, it is remarked that, "nearly one-fifth of the population of the United States live below 100 feet; more than two-fifths below 500 feet; more than three-fourths below 1,000 feet; while 97 per cent. live below 2,000 feet." In the area below 500 feet live nearly all the people engaged in manufactures, commerce, and in the culture of cotton, rice and sugar.

The Areas in Georgia are only approximate, but not far wrong

TABLE OF AREAS AND POPULATION ACCORDING TO ELEVATION ABOVE
SEA-LEVEL.

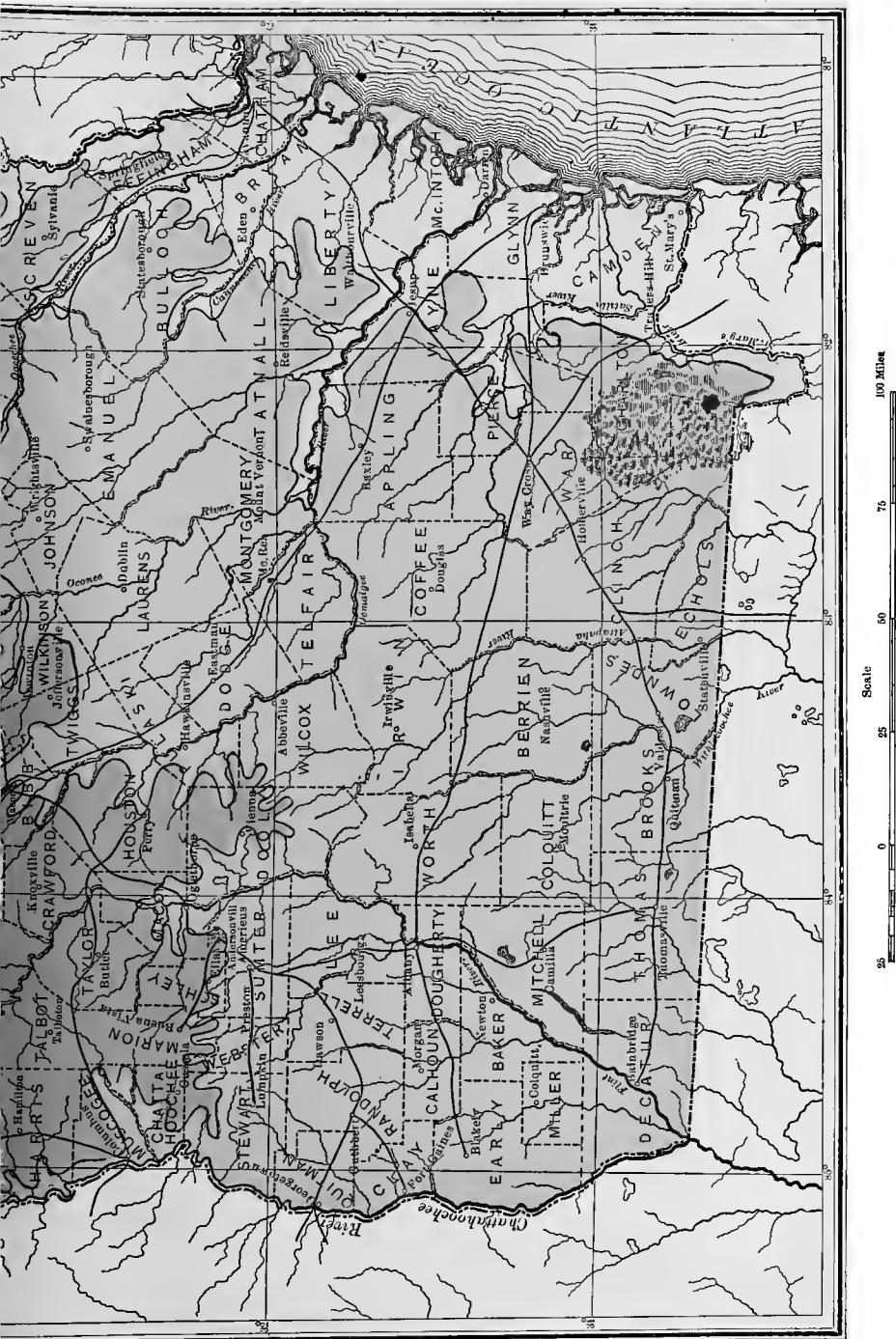
Georgia.

Above Sea-Level.	AREA.	POPULATION.			
FEET.	Square Miles.	Between the Levels.			Below Upper Level.
		Total.	Pr sq. Mile	Colored.	TOTAL.
0 to 100	3,000	86,000	29	45,000	.....
100 to 500	35,000	700,000	20	360,000	886,000
500 to 1000	15,000	620,000	45	300,000	1,406,000
1000 to 1500	3,200	125,000	40	20,000	1,531,000
1500 to 2000	1,300	8,000	6	600	1,539,000
over 2000	1,000	4,000	4	200	1,543,000

The United States.

0 to 100	181,000	9,152,296	50	1,466,233	.....
100 to 500	410,000	10,776,284	26	2,958,864	19,928,580
500 to 1000	554,300	15,129,227	27	1,704,158	35,952,900
1000 to 1500	367,400	7,904,780	22	354,013	46,857,680
1500 to 2000	180,000	1,878,715	11	59,556	48,736,395
over 2000	1,332,900	1,419,398	1	36,874	50,155,793

The average elevation of the State is between 600 and 700 feet.



Between 100 and 1000 over 80 per cent of the total population live ; nearly 90 per cent of the colored population.

In the *outline view* of Georgia, just presented, we have treated briefly of "*The Country*." A fuller treatment is needed, however, in certain aspects, especially of its topography and geology, soil, climate and natural products.

While these are all inter-related, geology is the most fundamental affecting all the other topics ; yet, topography being the most obvious factor, is therefore to be first treated. A topographical map of the State, based on full and proper data, is a great desideratum, and would teach the eye at a glance as much as a volume of description. But the materials for such a map are as yet very meagre. There is, however, a considerable mass of materials in the possession of the Coast Survey, in Washington City, which cost a large sum, and is perfectly available, yet has never been utilized by the State. It is very valuable.

This completes, perhaps, with sufficient fullness, the outline view of "the Country," an Empire in extent, full of variety, abounding in resources, and offering ample room for choice in the wide and diversified range of human pursuits.

CHAPTER III.

TOPOGRAPHY.

GENERAL SURFACE FEATURES OF THE STATE.

Georgia is naturally divided into a number of zones, extending across the State in direction approximately parallel with the coast line, differing more or less in geology, topography, climate and production.

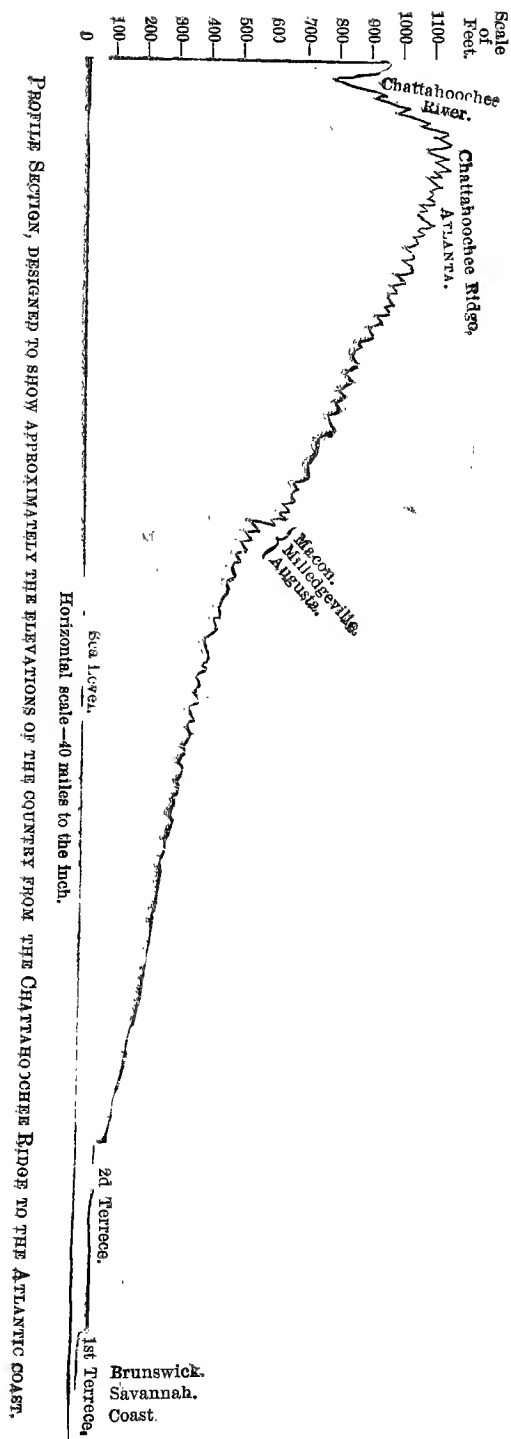
The State presents great variety in her topography. From an extensive area of nearly level surface in South Georgia the country graduates towards the north through undulating, rolling and hilly lands to a mountainous region of diversified character in North Georgia, rising at the same time from sea level to an altitude of five thousand feet.

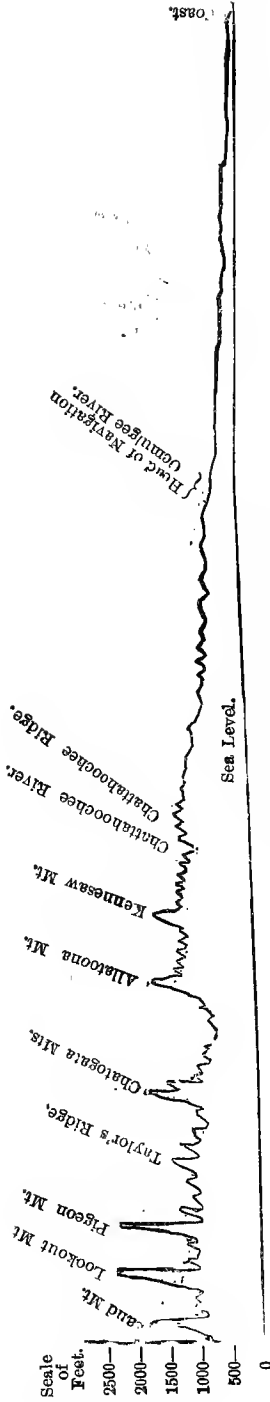
The State is divided by bold divides into three divisions: Lower, Middle and Upper Georgia, each having, along with much diversity in itself, some prominent characteristics in common throughout its extent.

The first of these natural divisions, beginning on the south, that of Southern or Lower Georgia, extends from Florida and the Atlantic coast, to a line crossing the State from Augusta to Columbus, and passing at the heads of navigation, near Milledgeville and Macon. This is an approximately level, sandy region, covering more than half of the State, and embracing all of the Cretaceous and Tertiary formations. This section graduates from sea level to about five hundred feet.

Beginning with the low marsh lands on the coast, the country rises by terraces, first to the height of twelve or fifteen feet above tide, and next, thirty or forty miles inland, to the height of seventy-five or one hundred feet. Beyond this the surface varies from nearly level to undulating, and becoming hilly in the upper, or northern part.

Middle Georgia is a broad, hilly region, having few elevations





Horizontal Scale—50 miles to the inch.

PROFILE SECTION, DESIGNED TO SHOW APPROXIMATELY THE RELATIVE ELEVATIONS OF THE COUNTRY FROM THE NORTHWEST CORNER OF THE STATE TO THE ATLANTIC COAST.

that are designated as mountains, and these, with few exceptions, are such as would hardly receive the distinctive name of a ridge in the more northern portions of the State. Lands too steep for the plow are of rare occurrence over the larger part of this area. Pine Mountain, in Harris, and Graves Mountain, in Lincoln, are elevations of a few hundred feet above the surrounding country, that form conspicuous features in the landscape.

Stone Mountain stands six hundred feet above the surrounding country, and covers, at its base, an area of about one square mile. This is a mass of denuded granite, destitute of vegetation, except here and there a bush or scrubby tree that has found foothold in the crevices of the rock. The summit affords a view reaching beyond the limits of the State.

The Chattahoochee Ridge is a prominent feature, forming a long water divide, reaching nearly across the State, from Habersham to Troup county. Atlanta is situated on the crest of this ridge.

One conspicuous feature of the larger portion of Middle and North Georgia, in marked contrast with Southern Georgia, is the existence of fragmentary stones, usually of quartz rocks, scattered over the surface of the lands.

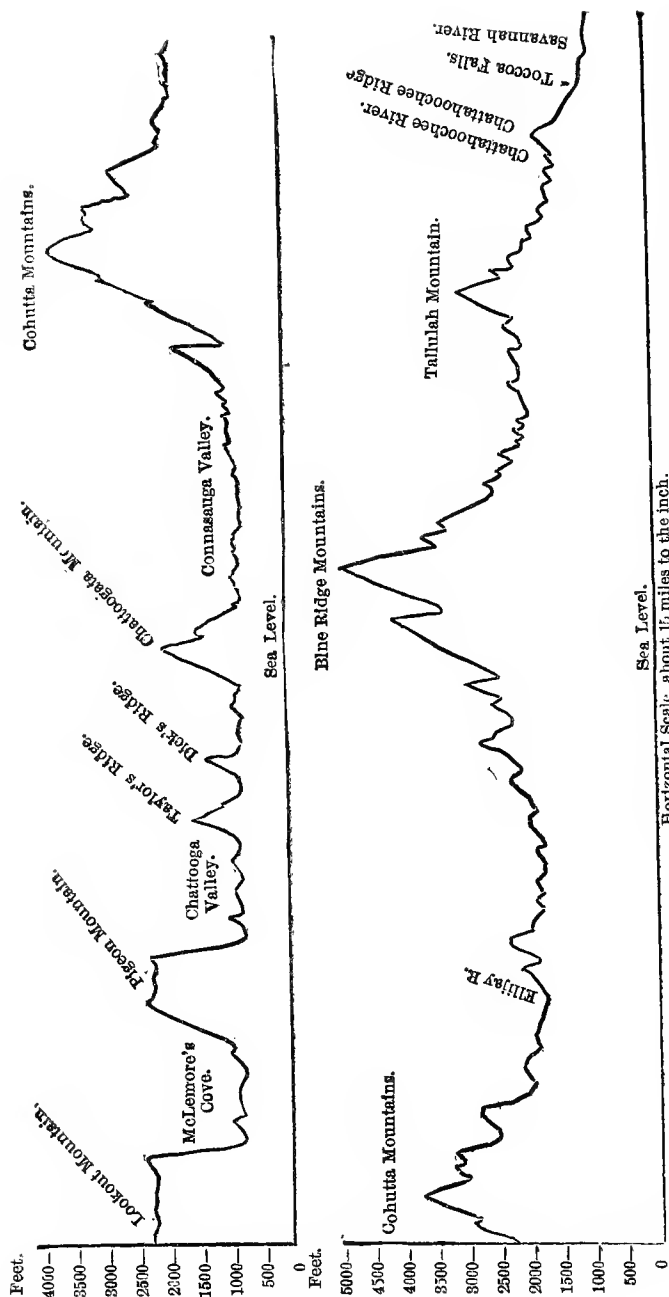
Upper Georgia embraces a section with striking peculiarities of surface and great variety in soil. Northeast Georgia varies from one thousand to five thousand feet above sea level. Northwest Georgia, generally distinguished as the *Limestone Region*, ranges from six or seven hundred to twenty-five hundred feet, and has an extent of 3,360 square miles, covering the larger part of ten counties.

Some of the features of these divisions of the State, particularly the topography, pass by almost imperceptible gradations into each other, but nevertheless become well marked distinctive characteristics of the geological divisions to which they pertain.

Some of the more important and distinguishing characteristics in the topography will be noticed more in detail in treating of the geology and of the agricultural features of the sections.

A general idea of the elevation above sea for all parts of the State may be had by reference to the Hypsometric Map.

About 3,000 square miles, near the Atlantic coast, has an altitude



PROFILE SECTION FROM THE ALABAMA TO THE SOUTH CAROLINA STATE LINES, DESIGNED TO SHOW THE GENERAL AND THE RELATIVE ELEVATIONS OF THE COUNTRY, NEAR THE NORTHERN LINE OF THE STATE.

of one hundred feet or less above tide ; 29,000, or about half of the State, ranges from one hundred to five hundred feet ; 20,000 square miles, from five hundred to one thousand feet ; and about 6,000 square miles is above the altitude of one thousand feet. A large part of the last area consists of steep ridges and mountains, some of which, in the Blue Ridge, reach an altitude of about five thousand feet above sea level.

The mountainous parts of the State lie in one degree of latitude north of the 34th parallel.

The Appalachian chain enters the State with several parallel lines of elevations. The highest of these, the Blue Ridge, has an altitude of from three thousand to nearly five thousand feet.

The Cohutta range, continuous with the Unaka, of Tennessee, three thousand feet in altitude, with an abrupt escarpment toward the valley of the Oostanaula, on the west, lies about twenty miles west of the Blue Ridge.

Next in order, on the northeast, comes the Lookout and Sand Mountain table lands belonging to the Alleghany system. Between the principal ranges of mountains here enumerated are numerous minor elevations or ridges observing a general parallelism. These decrease in height towards the southwest, and ultimately die out, the most easterly ranges disappearing first, and the others in succession. The Blue Ridge, as an unbroken chain, extends only about one-third the distance across the State, terminating abruptly. The Cohutta range continues into Alabama in a low elevation, known as Dugdown Mountain ; while the Table Land mountains, with their associated ridges, extend with decreasing altitudes many miles into Alabama.

DRAINAGE.

The streams of the State flow either into the Atlantic Ocean or into the Gulf of Mexico. The divide between these water-sheds runs from the Okefenokee swamp a northwesterly direction to Atlanta, whence it follows the Chattahoochee ridge a northeast direction to Habersham county, when it curves to the north, extending to Union county.

Of the Gulf drainage, the larger part flows directly to the gulf through the Chattahoochee and the Coosa rivers and their tributa-

ries, while some smaller streams near the northern line of the State belong to the Mississippi drainage. The divide between these systems runs a zigzag course, often crossing the trend of mountains and valleys from near the northwest to the northeast corner of the State, dipping into the States of Tennessee and North Carolina at several points.

RELATIONS OF THE TOPOGRAPHY TO THE ROCKS OF THE COUNTRY.

So closely is the topography of the State related to the geological conditions and structure that a knowledge of one suggests with much certainty the other. The mountains, valleys and plains are resulting features dependent primarily upon the character of the rocks. Each great geological formation is made up of a series of strata of different consistencies. The mountains and ridges of Georgia, probably without an exception, owe their relative elevation above the surrounding country to the greater capacity of their rocks to resist the erosive influences of the atmosphere, and not to independent upheavals, according to the popular idea of their origin. The harder rocks, or such as are least subject to decomposition, withstanding better the effects of the weather, are left behind in the general wearing down of the country and form its prominent features, while the softer, or less resisting materials, give rise to ravines, valleys, or broad plains, according to the extent of outcrop.

It is a fact of common observation that the rocks of the country have in general a northeasterly trend corresponding to the directions of the ridge and mountain chains. A little observation in a hilly or mountainous region, will serve to show that the rocks of the lower ground are made up of materials that readily decompose into softer materials, forming the clays or loose sands of the surface. The limestones often disappear entirely from the immediate surface and are covered up with the less soluble siliceous or argillaceous material of their own composition, or with the detritus from interstratified layers, while the more durable materials of which the mountains are made up commonly stand out in bold denuded bluffs.

Throughout Middle and North Georgia, the strata lie in a series of great folds or flexures, and the beds of rock come to the surface at all angles between the horizontal and the perpendicular. In this way the harder and softer materials, of which the formations are composed, are successively brought to the surface, and the streams, naturally selecting the softer beds, have worn out the hollows and valleys, leaving the harder layers to the higher grounds. This fact well displayed in the northwest part of the State, where the valleys are scooped out of the softer limestones and shales, while the more resisting sandstones and conglomerates are left behind in the general wearing down, and now enter into the structure of the ridges and mountains. For an illustration of this fact see the Geological Section from Lookout Mountain to Dick's Ridge in a subsequent chapter.

A geological section of this part of the State exhibits the strata in folds like a fluted ruffle, and the mountains, with few exceptions, situated on the downward, or synclinal fold of the strata, and the valleys on the upward, or anticlinal folds, so that, contrary to the popular idea, the valleys, and not the mountains, are on relatively upheaved strata. A plausible explanation of these facts is suggested in the evident general tendency of an upward fold to loosen the texture, and thus promote the disintegration of the rocks as well as to produce, possibly by fissure, convenient outlets for springs, as well as channels for streams, which, when conforming to the trends of the rocks, follow, in most instances, the anticlinal axes. The downward fold of the strata, on the contrary, naturally tends, by compression, to harden the beds, thus fitting them the better to resist erosion, so that we have, in such situations, some of our highest mountains and ridges. The layers of strata, of which the synclinal mountains are composed, have been literally washed off to the ocean from the areas now constituting the valley, and which, except for this erosion, would now be the highest lands of the country. Most, perhaps all, of the geological formations of the State give evidence of their formation by slow deposition, in the bed of the ocean, and whatever may have been the surface of the land on first emergence, the existing surface features are largely, if not altogether, due to

erosion, controlled by the elevation above tide, and the stratigraphic condition alluded to as favoring or resisting this action.

ELEVATIONS.

The following are the elevations above the average sea level of some of the prominent mountains and other points of interest in the State, determined by the United States Coast and Geodetic Survey :

	Elevation in feet.
Sitting Bull* (middle summit of Nantahela) Towns county.....	5046
Mona* (east summit of Nantahela) in Towns.....	5039
Erota, in Towns county.....	4797
Rabun Bald, in Rabun.....	4718
Blood, in Union.....	4468
Tray, in Habersham.....	4403
Cohutta, in Fannin.....	4155
Dome, in Towns.....	4042
Grassy, in Pickens.....	3290
Tallulah (northwest summit) in Habersham.....	3172
Tallulah, (southeast summit) in Habersham.....	2849
Yona, in White.....	3167
Walker, in Lumpkin.....	2614
Lookout, (at High Point) in Walker.....	2391
Pine Log, in Bartow.....	2340
Lookout, (at Round Mountain) in Walker.....	2331
Pigeon, (at High Point) in Walker.....	2329
Skit.....	2075
Sawnee, in Forsyth.....	1968
Kennesaw, in Cobb.....	1809
Stone Mountain, in DeKalb.....	1686
Sweat.....	1693
Lavender, in Floyd.....	1680
Cleveland Church, in White.....	1616
Taylor's Ridge, in Chattooga.....	1556
Dahlonega Agricultural College.....	1518
Mt. Alto, in Floyd.....	1505
Clarksville Court House, in Habersham.....	1478
Carns Mountain in Polk.....	1296
Atlanta, Capital, (Flag Staff).....	1163

The following are elevations of points in Georgia, on the line

*The latitude of Sitting Bull at the point where this height is given is $34^{\circ} 59' 53''$, longitude $83^{\circ} 31' 32''$, and the latitude of Mona $34^{\circ} 59' 55''$, longitude $83^{\circ} 29' 11''$. The latitude shows the summit to be very near the line of the State.

of railroads, and which has been determined by the railroad surveys:

WESTERN & ATLANTIC RAILROAD.

FROM ATLANTA, GEORGIA, TO CHATTANOOGA, TENNESSEE.

Stations.	Distance in miles.	Elevation in feet.
Atlanta.....	0	1050
Chattahoochee Bridge.....	8	832
Chattahoochee River.....	8	762
Marietta.....	20	1132
Railroad Summit.....	23	1156
Acworth.....	34	932
Allatoona Creek, about	—	805
Allatoona.....	—	875
Etowah Bridge.....	47	771
Etowah River.....	47	696
Kingston.....	60	721
Adairsville.....	70	723
Calhoun.....	80	653
Oostanaula Bridge.....	85	655
Oostanaula River.....	85	623
Dalton.....	100	773
Tunnel Hill.....	107	859
Ringgold	114	776
Tennessee Line.....	—	714
Chattanooga, Tennessee.....	138	663

EAST TENNESSEE, VIRGINIA & GEORGIA RAILROAD.

FROM DALTON TO ALABAMA STATE LINE.

	Elevation in feet.
Dalton	782
Rome.....	652
Cunningham.....	707
Cave Spring.....	697
Reeves.....	658
Six Mile.....	709
Van's Valley.....	662
Pryor's.....	844
Alabama State Line.....	930

ROME TO ATLANTA.

Rome.....	652
Silver Creek.....	677
Price's Station.....	863
Seney	830
Rock Mart.....	762

	Elevation in feet.
McPherson	1005
Braswell.....	1052
Chattahoochee Bridge ..	814
Fair Grounds, Atlanta.....	986

MACON TO CHAUNCEY.

Macon.....	355
Reed's.....	280
Bullard's.....	265
Adam's Park.....	265
Buzzard Roost.....	240
Cochran.....	340
DuBois.....	394
Eastman.....	361
Chauncey.....	303

THE GEORGIA PACIFIC RAILWAY.

FROM ATLANTA TO TALLAPOOSA RIVER.

Stations.	Distance in miles.	Elevation in feet.
Union Depot, Atlanta.....	0	1050
Howell.....	3	962
Peyton.....	7	869
Chattahoochee.....	8	822
Bottom of Chattahoochee River.....	8 $\frac{1}{8}$	750
Concord.....	12 $\frac{1}{4}$	867
Mableton.....	15	995
Bottom of Sweetwater Creek.....	17 6-10	873
Austell.....	18 $\frac{1}{4}$	940
Salt Springs.....	23 $\frac{3}{4}$	1055
Douglasville.....	26 $\frac{3}{4}$	1217
Winston.....	32	1132
Villa Rica.....	38	1160
Temple.....	45 $\frac{1}{4}$	1180
Bremen.....	54	1413
Waco.....	56	1343
Tallapoosa.....	63 $\frac{1}{2}$	1154
Bottom of the Tallapoosa River.....	68	945

ATLANTA & WEST POINT RAILROAD.

Stations.	Elevation in feet.
Atlanta.....	1050
East Point.....	1062
Fairburn.....	1048
Palmetto.....	1039
Newnan.....	985
Grantville.....	892

TOPOGRAPHY.

	Elevation in feet.
Hogansville.....	768
LaGrange.....	778
West Point.....	620
Chattahoochee River.....	600

RICHMOND & DANVILLE RAILROAD, (Atlanta and Richmond Air-Line.)

ATLANTA TO TOCCOA.

Stations.	Distance in miles.	Elevation in feet.
Atlanta.....	0	1050
Doraville.....	15	1070
Norcross.....	20	1050
Suwanee.....	31	1027
Buford.....	37	1207
Flowery Branch.....	44	1122
Gainesville.....	53	1222
Bellton.....	67	1342
Mt. Airy.....	80	1588
Mt. Airy (By U. S. Geodetic Survey) ...	—	1610
Toccoa	93	1040

ATHENS TO CLAYTON.

Athens Depot	600
Lula.....	1326
Clarksville.....	1492
Tallulah.....	1626
Rabun Gap.....	2220
Clayton.....	1970

ELBERTON TO TOCCOA.

Elberton.....	663
Toccoa	1025
Lowest point on the line, about.....	600

CENTRAL RAILROAD.

MACON TO SAVANNAH.

Stations.	Distance in miles.	Elevation in feet.
Ocmulgee River, low water.....	0	263
East Macon Depot.....	0	297
Griswold.....	10 $\frac{1}{4}$	464
Gordon.....	20 $\frac{1}{4}$	343
McDonald.....	30 $\frac{1}{4}$	245
Emmit.....	38 $\frac{1}{4}$	210
Oconee River.....		186
Oconee.....	42 $\frac{1}{2}$	221
Tennille.....	55 $\frac{1}{4}$	
Davisborough.....	67 $\frac{3}{4}$	291

Stations.	Distance in miles.	Elevation in feet.
Spears.....	78¾	238
Sebastopol.....	90¼	190
Herndon	100¼	174
Millen	110¼	158
Paramore's Hill.....		233
Scarborough.....	120¼	148
Ogeechee.....	129	106
Halcyondale	140¼	110
Little Ogeechee, Scriven county.....		106
Egypt.....	150¼	126
Guyton.....	160¼	77
Eden	170¼	34
Station No. 1.....	180¼	19
Savannah Depot.....		32

ATLANTA TO MACON.

Atlanta.....	0	1050
Rough and Ready.....	11	1004
Jonesboro	21½	905
Fosterville	28	960
Griffin.....	48	975
Milner.....	54	863
Barnesville.....	61	875
Forsyth.....	77	735
Prattsville.....	85	625
Macon Depot.....	102	414
Low Water, Ocmulgee River.....	—	263

MACON TO ALBANY AND FORT GAINES.

Macon Depot.....	333
Tobesofkee Creek Swamp.....	275
Tobesofkee Creek Track.....	290
Tobesofkee Creek Bridge.....	295
Bridge between Tobesofkees and Echaconnee Summit.....	379
Bridge proper.....	390
Seago's.....	360
1½ Byron's.....	513
2 Powersville	385
Fort Valley.....	528
Ridge at Slapp's Quarter beyond Indian Creek.....	505
Uniform Table-land to Marshallville.....	491
Winchester.....	463
Gradual Ascent to Flint River Bridge.....	290
Oglethorpe	299
Camp Creek Bridge.....	306
Andersonville	394

	Elevation in feet.
Ellaville.....	589
White Water Creek Culvert	361
Stewart's Turnout.....	474
Americus.....	360
Smithville.....	332
Kinchafoonee Bridge.....	275
Brown's Station.....	369
Dawson.....	352
Grave's Turnout.....	350
Nochway Bridge	292
Ward's Station	392
Bridge beyond Ward's.....	415
Fachitla Creek Bridge.....	342
Cuthbert Depot.....	446
Junction	484
Morris Station.....	242
Coleman's	391
Fort Gaines Depot.....	163½
Fort Gaines Bridge.....	190 about

GEORGIA RAILROAD.

ATLANTA AND AUGUSTA BRANCH.

Stations.	Distance in miles.	Elevation in feet.
Atlanta.....	0	1050
Decatur.....	6½	1049
Stone Mountain.....	15¾	1055
Lithonia.....	24¼	954
Conyer's.....	30¾	909
Yellow River, about.....	—	670
Covington.....	41	763
Alcove (Ulcofauhatchee River), about.....	—	674
Social Circle.....	51¾	890
Rutledge.....	59	728
Madison.....	68	696
Buckhead.....	75½	642
Oconee, about.....	—	514
Greensboro.....	88	627
Union Point.....	95	674
Crawfordville.....	106¾	618
Cumming	111¼	647
Canak.....	124	613
Thomson.....	133½	531
Dearing.....	142	489
Berzelia.....	150¼	517
Belair.....	161	324
Augusta Depot.....	—	147
Savannah River.....	—	119
Hamburg Depot, South Carolina.....	—	152

MACON TO AUGUSTA.

Stations.	Elevation in feet.	Surface
East Macon.....	285	
Low Water, Ocmulgee River.....	241	
Wolf Creek.....	415	
Commissioner's Creek.....	422	
Summit between Commissioner's and Fishing Creek.....	493	
Fortville.....	459	
Fishing Creek.....	373	
McCrary's.....	330	
Camp.....	231	
Milledgeville.....	264	
Tobler's Creek.....	255	235
Oconee River.....	269	214
Rocky Creek.....	350	315
Dry Pond Summit.....	593	648
Town Creek.....	575	540
Sparta.....	545	
Two-mile Branch.....	488	458
Little Ogeechee.....	485	440
Culverton.....	537	
Dry Creek.....	488	453
Folsom's Creek.....	375	365
Ogeechee River.....	375	
Long Creek.....	348	313
School-house Summit.....	525	550
Rocky Comfort.....	455	415
Golden Creek.....	453	428
Warrenton Depot.....	488	

ELEVATIONS IN GEORGIA ASCERTAINED BY J. E. THOMES, C. E., IN MAKING A UNITED STATES RAILWAY SURVEY FROM THE TENNESSEE RIVER THROUGH FISHER'S GAP, ON SAND MOUNTAIN, ALABAMA, TO THE ATLANTIC COAST, IN GEORGIA, IN 1875.

The line of this survey enters Georgia in the neighborhood of the old Burnt Village, in Troup county, crosses the Thomaston branch of the Macon and Western Railroad, passes through Culloden in Monroe, Knoxville in Crawford, crosses the Ocmulgee above Hawkinsville, and passes through Eastman in Dodge county, and from there nearly follows the line of the Macon and Brunswick Road to Brunswick.

The length of this line from the Tennessee river to Brunswick is 412 miles, over 250 of which is in Georgia.

The elevations above the sea level are as follows:

Stations.	Elevation in feet.
Chattahoochee River.....	674
Maple Creek.....	745
Mountain Creek.....	743

	Elevation in feet.
St Cloud Road.....	861
Atlanta and West Point Railroad.....	920
Flint River.....	697
Concord.....	804
Elkin's Creek.....	711
Powder Creek.....	724
Potatoe Creek.....	669
Thomaston Branch Railroad.....	804
Tabler's Creek.....	661
Culloden.....	696
Knoxville.....	640
Rich Hill.....	619
Mill Creek.....	504
Muscogee and S. W. Railroad.....	478
Ocmulgee River (low water).....	214
Hawkinsville Branch M. and B. R. R.....	336
Limestone Creek.....	250
Macon and Brunswick Railroad, 134th mile post.....	391
Eastman	356
McRae Station.....	224
Sugar Creek.....	103
Lumber City.....	147
Ocmulgee River (low water).....	259
Carter's Creek	146
Boggy Creek.....	93
Savilla.....	87
Atlantic and Gulf Railroad.....	118
Pinholloway River.....	39
Buffalo Swamp	25
Ten-Mile Creek.....	25
Brunswick Depot.....	16

On this line, Eastman is 112 miles and Culloden 212 miles from Brunswick.

OKEFENOKEE SWAMP.

A line of levels was run by the Geological Survey in 1875 from Mixon's Ferry on Suwanee river to Trader's Hill on the St. Mary's, showing the following elevations above ebb tide:

Water surface at Mixon's Ferry.....	107.3
Bench B, in Pocket.....	122.1
Bench D, in Pocket.....	120.4
Bench F, in Pocket.....	121.3
Swamp between Pocket and Jones Island.....	116.5
Jones Island.....	121.4
Swamp between Jones Island and Billy's Island.....	116.4
Billy's Island.....	118.0
Bench of Billy's Island.....	123.8

Camp Lee, Billy's Island.....	125.6
Billy's Lake, Water Surface.....	116.0
Swamp E of Billy's Island.....	119.0
Two miles from Billy's Island, on Little Trail	119.3
Prairie West, Side-Water Surface.....	121.2
Rodenberry's House, East side.....	153.3
Long Branch, two miles from Rodenberry's House.....	55.1
Trader's Hill.....	79.0
Water Surface, St. Mary's River.....	5.0

A line of levels, which was run round the swamp and connected with the water in the St. Mary's river near Trader's Hill in 1857, by Colonel R. L. Hunter, furnishes the following information in regard to the elevation of the surface at different points:

The highest part of the swamp is its northern extremity, where it is $126\frac{1}{2}$ feet above tide-water. Coming south, in six miles it descends five feet, and then in thirteen miles from the last point it descends only one and a half feet on the east side—it being at that point (Mr. Mattox's) 120 feet above tide-water, while at an opposite point on the west side (the mouth of Surveyor's creek), it is only $116\frac{1}{2}$ feet.

A nearly uniform descent continues from Mattox's to the southeast corner of the swamp, where the elevation is $116\frac{1}{2}$ feet, while near Ellicott's Mound, where the branch of the St. Mary's runs out of the swamp, it is only $111\frac{1}{2}$.

From the mouth of Surveyor's creek to the extreme western angle of the swamp, it falls scarcely any, but on turning eastward towards the Suwanee river it gradually descends, and when that stream comes out of the swamp it is only about $110\frac{1}{2}$ feet above tide.

At the northeast point of the pocket it is $114\frac{1}{2}$ feet. From that point it falls towards the place where Cypress creek runs out, where it is about $111\frac{1}{2}$ feet. Then it rises to $118\frac{1}{2}$ feet when half way to the St. Mary's, and gradually falls again to it.

CHAPTER IV.

CLIMATE.

A stranger studying the South—with which section Georgia is centrally identified—is especially interested in three subjects, viz : the climate, the negro, and cotton. Of all matters connected with the Country, the climate most interests him. Of those connected with the People, the negro interests him most, for he feels that he already knows the whites. So of products. Cotton is the special product of the State ; corn, grain, etc., he already knows. We shall therefore endeavor so to present each of these three subjects, as at once to gratify natural curiosity, and furnish full information.

Climate is perhaps the most important condition in the environment of a people. It embraces in its scope health and comfort, spirits, brain force, muscular force and vigor ; in a word, nearly all our enjoyments and all our faculties. It affects profoundly our modes of living, our in-door and out-of-door life, and comes home to us in a thousand ways.

And climate, moreover, is a gift of nature, not a product of art. It is peculiarly a *datum*; a bestowment. We can deal with a poor soil—we can fertilize it—but it is hard to deal with a bad climate. We must submit to it.

Not less marked are its effects on production ; on all that grows from the ground. Climate is a controlling condition on all vegetation, on trees and grasses and natural products, and not less so on cultivated crops, vegetables and fruits ; equally so on animal life, on its vigor, its diet, its needs and its supply of food.

Climate, therefore, is the inexorable and indispensable condition of comfortable life. It determines race tendencies largely. It has framed the Esquimaux and the Patagonian, the Malay and Papuan, the white man, the yellow, red and black man. It, too, determines

crops, the staples of a country—cotton or corn, the cereals, rice or sugar.

Therefore, it is ever a matter of inquiry, what of the climate?

A general view of the climate of Georgia yields a very favorable result. It is an excellent climate for health, comfort and production. In the comparison of it, however, with that of States further North or South, some unexpected things are observed. We speak of the Sunny South—sometimes of the wintry North—yet the changes are very gradual, being wholly of degree, not of kind. The character of the difference shows itself rather unexpectedly, much more in the extremes of cold than of heat. Indeed, the extreme heat of the North equals, and sometimes surpasses, that of the South. There are more sun-strokes. The difference is that here the warm weather begins sooner and lasts longer; it begins earlier in the year and at an earlier hour of the day. So the cold at the North pervades more of the year and of each day. Indeed, the climate is observed perhaps more in its effects than in our feelings. As one goes from Georgia through North Carolina and Virginia the change steals upon him very slowly. The forest-growths seem much the same; he still sees oaks and hickories and pines, even persimmons. In Richmond, magnolias, though not indigenous, are as common as in Augusta or Savannah. Cotton is still seen in many fields. The elements are all the same, only somewhat differently mixed. Going farther North the changes are more frequent and manifest. Yet the writer, after all, has suffered more with heat at the North than at the South. The warmest and most oppressive days he has ever passed were one at Niagara Falls and one in Boston; the warmest night in Albany, N. Y. On the other hand, he has suffered in-doors more with cold at the South than ever at the North. The reason is not far to seek: we prepare for summer, they for winter. Our houses have broad halls and wide piazzas. In winter these halls are chilly and these piazzas keep off the sun. We have few or no furnaces, but only the occupied rooms are heated. So we suffer with cold occasionally, but not often and severely enough to compel the needful provision against it. Indeed, with one-fourth of the provision made at the

North our winter climate could be made delightful within doors, as it now is, relatively so, out of doors. It is far less trying to housed cattle, and other animals also, and so we provide less for them. All this illustrates the general law of human inertia, which only yields to stimulus, instead of embracing opportunity.

But an unusual proportion of the year is pleasant here as compared with other sections. In few parts of the world can the remark be so often made: "this has been a perfect day." The fall is filled with such days, delightful alike for man and beast, in which it is a luxury simply to live. They often occur in other seasons, however, and especially abound in the Indian summer. We have hot weather, it is true, and cold, but a very desirable average for all the purposes of human life. Ours is an excellent climate the year round, and for invalids we have both a summer and a winter sanitarium within our own borders.

CLIMATE AND MAN.

The range of absolute temperature is immense, reaching from a point some hundreds of degrees (300 or 400) below zero to a point some thousands above; our personal range, however, is very narrow: that of comfort, aside from artificial provisions, being only a few degrees. Says Sidney Smith, "with the thermometer under 20 or over 78, all human affections cease: one is occupied solely with his own misery." Aside, indeed, from clothing, shelter and fire, the range of human comfort would be only 10 or 15 degrees.

The usual temperature of the human body is about $98\frac{1}{2}$ degrees F., or 38 C. Of the requisite number of degrees for keeping up this temperature the heating apparatus in each man's person supplies about 30 degrees, requiring 68 from external sources. If the air does not supply this we need a stove without, in addition to the stove within. If the air is much above this, the apparatus for the waste of excess of heat, by perspiration and evaporation, is called into active play.

As the average temperature of Georgia is 65 degrees, our fluctuations are round and about the proper point of equilibrium and the drain on the system reduced to its lowest average level. Were this uniform, indeed, instead of average, there would scarcely be

any demand for fire in the winter, or for ice or fans in the summer. Exercise and labor add to the temperature of the body, but by reason of increased perspiration a compensation is made. For active, out-of-door work, a temperature of 40 to 60 is good, for indoor, 68 to 75. Prof. Draper says that a mean annual temperature of 62 degrees is the most pleasant climatic mean for human comfort.

THE CAUSES AFFECTING CLIMATE.

The one great source of climate is the SUN. The moon, stars and planets, nay, even the internal heat of the earth itself affect it but slightly. The moon's rays at the full do not affect the most delicate thermometer. The great source of climate is the *sun*, the *SUN*! the *SUN*!! The MODIFIERS of climate are more numerous, all depending, however, on the one cause. The special relations of the earth to the sun, in different localities, determine the climate. Of these, latitude is a chief factor, with the consequent slope of the earth's general surface towards the sun. Climate, indeed, means slope.

Topography also affects climate, partly by reason of local slopes to and from the sun's rays, partly by obstructions to the wind. Natural products also affect it, such as trees and grass, by shading the earth's surface. So the soil has its share of influence by virtue of color and texture reflecting or absorbing heat. The proximity of the water of ocean, lakes or rivers exerts also a great influence on climate. The influence of moisture, also, is prodigious.

THE GREAT MEDIUM of climate, however, is the atmosphere. Even as the sun is its source, so, with much emphasis, the great medium is the AIR—*climate is in the air*. Our direct contact with the earth, and with objects generally, is comparatively small; but the air environs and envelopes us closely, and distributes to us with wonderful readiness and rapidity the temperature and moisture which it gathers to itself from far and near. Aside from the air, the local variations would be vastly greater and more trying than they now are. We should warm on one side and freeze on the other. Radiation from the sun as from a fire would be wholly inadequate to keep us comfortable—unless we were on a spit, rotating to expose all sides to the heat. We should be in an *Inferno*, burning and freezing alternately. Indeed, a large number of nice

and delicate conditions are necessary to adapt a climate to man's needs. The mere absence of moisture in the air, for example, would render the latter uninhabitable. We know what a part is played by the relative length of day and night. Many are the nice adjustments needed.

This great ocean of air, with its enormous mobility, rising above the mountains, not only equalizes the temperature, but is the medium of nearly all other weather phenomena. It bears up the clouds; its movements are the winds; it generates the storm, the lightning and the thunder. Besides its local and variable currents, grand earth currents are forever in motion; these are laden for us with good or ill—they bring us dry weather or rain. Evaporation and distribution both depend on this all-pervading atmosphere.

Very dependent are we also on its purity. It is the medium of health and sickness; it is essential to our breathing, yet it may bear miasma into our lungs a thousand times an hour. Some writer speaks well the praises of pure air, calling it "that *gaseous food* of which we partake every minute of our lives, and without which we cannot live as many minutes, as without any other food we may live days."

The more important FACTORS of climate are HEAT, RAIN and WIND. The peculiar atmospheric condition indicated by the presence of ozone exerts a decided influence on health and spirits. Each of these factors is very variable in its relations to time and place, varying with the season, the hour of the day, locality, etc. It is therefore almost impossible to grasp or to describe so complex a thing as the climate of a State as a whole. Averages help us, but, after all,

DISTRIBUTION

is yet more important. It deserves stress in the study of the weather, as does the sun the source, and the air, the medium of all its changes. The average temperature may be just right, yet never a comfortable day be spent, nor an influence felt favorable to vegetation. The average rainfall may be just what is needed, yet no crops made; the average may be made up of a succession of floods and droughts. And so it is *distribution* which is the important

condition. Of the 50 inches of rain which fall in a year, the proper distribution of 6 inches would insure excellent crops.

WEATHER RECORDS.

These should present all the important facts, especially of heat and rain, and in such a way as not only to give extremes and means, but *distribution*. We wish to know the annual and diurnal changes which occur, the sudden changes in temperature, the *intervals* in rain-fall. The number of days interval between rains is more important than the exact quantity; so also the rate of fall, whether sudden or slow, whether washing rains or rains absorbed. In the Appendix we will present some suggestions as to the

FORM OF WEATHER TABLES

to secure the desired results. Modern methods have an immense advantage over the old in the extent and variety of observations rendered possible by improved instruments. Perhaps we have not as yet, however, made full use of our means in *tabulating* the results of observations. An observer in Washington city virtually overlooks a continent, as it were, from a balloon. The same telegraphic facilities which give these superior advantages, enable him at once to distribute the information over the whole country.

In Georgia, our climate is affected by an unusual variety of causes. We lie between the Atlantic and the Gulf. The latter is usually, perhaps, though not always, our weather-breeder. We lie, also, below the mountain ranges. One of our problems is *immense local variations* and their causes. Do we not need not only weather records kept for the State, but in some sections numerous records for a single county? Our county agricultural clubs could perhaps arrange so to keep such records as to throw much light on the problem; meanwhile the farmer who kept them will have lost nothing in intelligence and knowledge of his affairs.

ACTUAL CLIMATES OF GEORGIA.

We have given already a general idea of the climate of the State as a whole, and the climates of the several sections (see pages 11 and 12). From the very valuable tables compiled by Col. R. J.

82° 81° 80°

LEGEND

- Below 56°
- 56° to 60°
- 60° to 64°
- 64° to 68°
- 68° and over.

TEMPERATURE MAP OF GEORGIA.

SPRING.

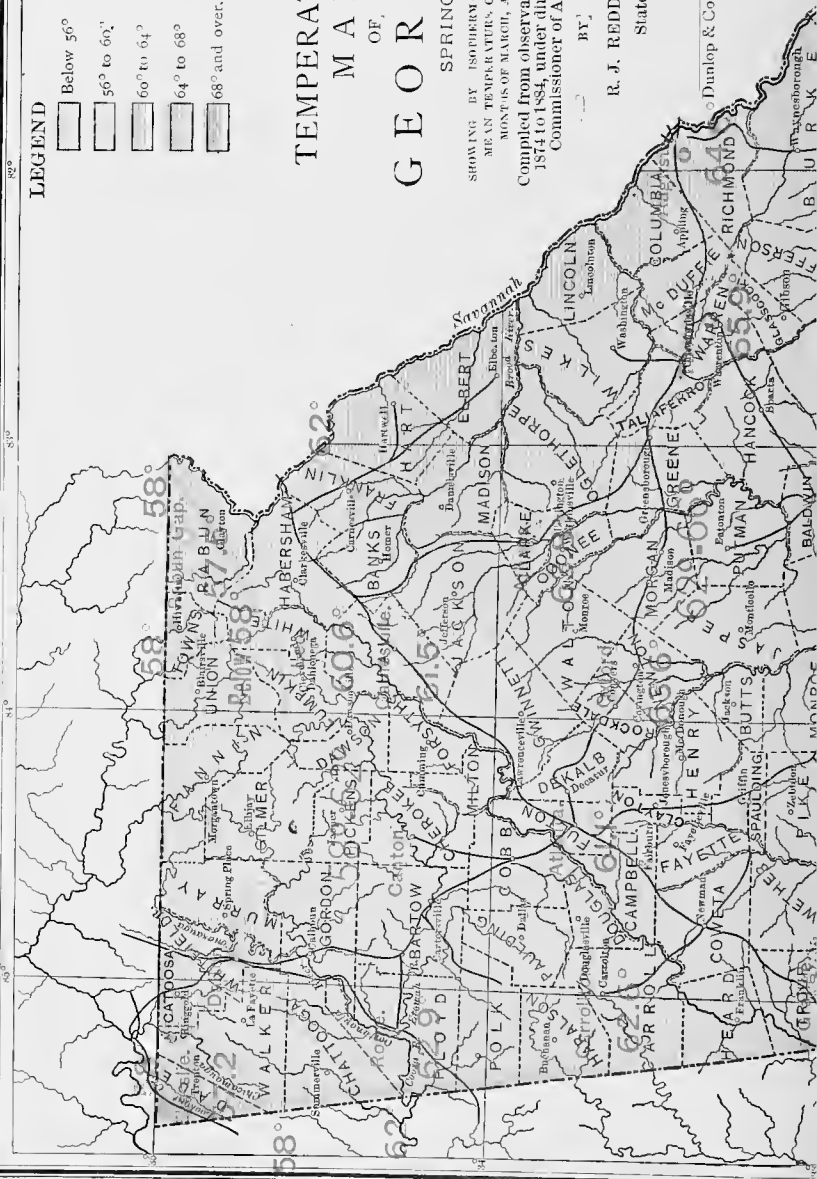
SHOWING BY ISOTHERMAL CURVES, THE
MEAN TEMPERATURE, OF THE THREE
MONTHS OF MARCH, APRIL, MAY

Compiled from observations made from
1874 to 1884, under direction of the
Commissioner of Agriculture.

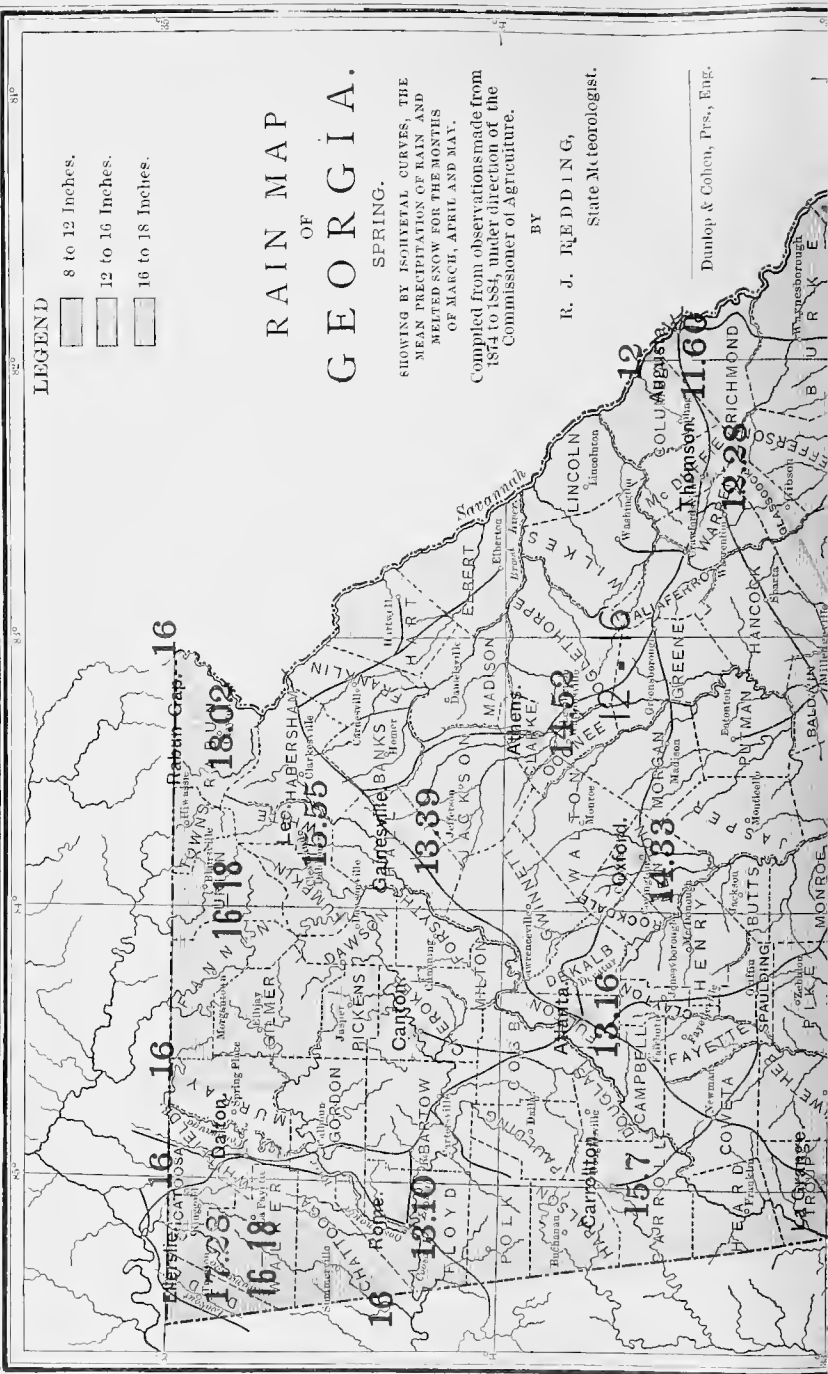
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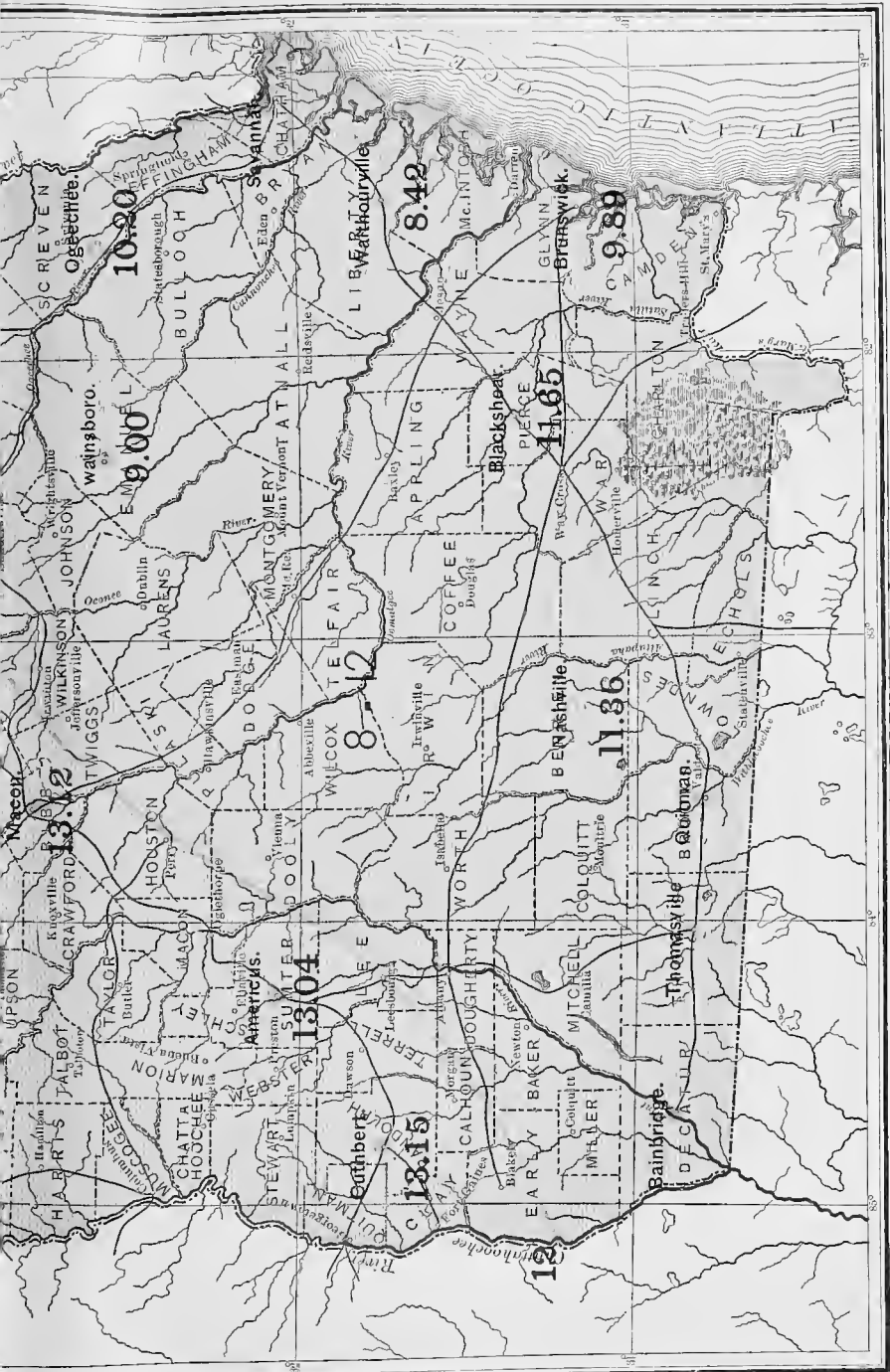
R. J. REDDING,
State Meteorologist.

Dunlop & Cohen, Pres. & Engs.











Redding, of this department, we derive the following information, the result of five or six years of observation.

More detailed tables will be given on subsequent pages, showing the range of temperature, etc., at specific localities.

Table of Temperature and Rainfall in Georgia, 1878--1883.

TEMPERATURE—

	The State.	North Georgia	Middle Georgia	N. W. Georgia	East Georgia	S. E. Georgia
Average Annual.....	65.1	59.2	63.5	68.1	66.1	68.9
Spring.....	63.8	58.8	63.0	68.0	65.7	68.3
Summer.....	79.7	75.3	79.2	81.1	81.4	81.4
Autumn.....	66.0	59.9	64.1	69.3	66.1	70.3
Winter.....	50.1	42.8	47.2	54.0	51.3	55.6
Summer Av. above Winter	29.6	32.5	32.0	27.1	30.1	25.8

RAINFALL—

Average Annual.....	49.3	60.2	49.7	47.3	41.4	47.8
Spring.....	12.4	15.5	13.7	12.5	10.3	10.0
Summer.....	13.4	13.6	12.6	14.5	12.3	14.2
Autumn.....	11.0	12.7	9.0	9.7	9.6	14.1
Winter.....	12.4	18.4	14.5	10.6	9.2	9.5
Av. Elevation above Sea--feet	1600	1,700?	750	400	125	100

CLIMATIC NOTES—TEMPERATURE.

We observe that the average summer temperature exceeds the average annual temperature about 15 degrees, while that of winter falls 15 degrees below the annual. The spring average corresponds with the annual almost exactly, not varying from it a half degree, and this little variation is *below* the annual. The fall average exceeds the annual slightly, being less, however, than one degree above it.

Comparing the averages of the sections: Southeast Georgia, the highest, with an annual average of 68.9, exceeds Northeast Georgia, the lowest, with its average of 59.2, by 9.7 degrees. The difference in summer temperature is but 6.1 deg., while that of winter is 12.8. Comparing single localities, the highest annual average is at Blackshear, 70.3 deg., and the lowest at Rabun Gap, 56.3,

showing a difference of 14 deg. Blackshear (in Pierce county) is in latitude $31^{\circ} 15'$ and 127 feet above sea level; and Rabun Gap, in latitude $34^{\circ} 55'$ and 2,168 above sea level.

The difference is in striking accord with the usual estimate of the effect of latitude and elevation on temperature, which assigns two degrees difference in the thermometer for one degree of latitude, and one degree of the thermometer to three hundred feet of elevation. The difference of latitude (a little over three and a half degrees) would give 7 degrees; and that of elevation, 2,000 feet, about 7 deg., together making the actual difference, above expressed, 14 deg.

Of all localities, Thomson, McDuffie county, comes nearest the average annual temperature of the State, varying from it less than a half degree. The State average, 65.1; Thomson, 64.7. Macon exceeds the State average 1 deg., Augusta falls below it 1.1 deg. In summer temperature Athens corresponds exactly with the State average, 79.7; Thomson varies very little from it, 79.5; Augusta, 79.8.

Comparing winter temperature, that of the State averaging 50.1, Swainsboro, Emanuel county, comes nearest this average, 50.4; Thomson next, 49.1; Augusta 48.9; Macon 51.3. Thus Augusta, Thomson and Macon have nearly typical average climates.

RAINFALL.

The highest annual average is at Rabun Gap, 71.7 inches; the lowest at Swainsboro, Emanuel county, 39.4—showing a difference of 32.3 inches, the annual average for the State being 49.3. Middle Georgia nearly corresponds, 49.7. The greatest fall in any section is in North Georgia, 60.3, the least in East Georgia, 41.4.

The annual rainfall of Atlanta, 49 inches, is near the average of the State.

The summer rainfall is by far the most important. That of the State averages 13.4 inches; North Georgia nearly corresponds, with 13.6; Southwest Georgia has the greatest average summer rainfall, 14.5 inches.

Of the various stations, Brunswick has the greatest average sum-

mer rainfall, 16.6 inches; Americus 16; Rabun Gap 15.4; Atlanta, among the least, 10.80; Rome, the least, 10.2.

Such are the averages for the year and the seasons. Let us next observe monthly averages:

Table of Monthly Averages.

	TEMPERATURE.			RAINFALL—INCHES.		
	The State.	Rabun Gap Lowest.	Blackshear. Highest.	The State.	Rabun Gap Highest.	Ogeechee. Lowest.
January.....	48.4	39.5	55.7	4.63	7.09	3.47
February.....	52.7	43.2	60.5	3.57	7.06	2.65
March.....	57.4	46.2	62.4	4.91	7.86	3.70
April.....	64.5	56.2	68.7	4.75	5.75	1.93
May.....	72.4	63.0	75.4	2.72	4.41	4.05
June.....	77.9	70.2	80.0	4.00	5.71	2.22
July.....	81.8	73.6	84.2	4.13	3.84	2.87
August.....	79.3	71.4	82.5	5.31	5.89	3.92
September.....	75.0	66.5	80.2	4.45	6.06	6.97
October.....	67.5	59.6	74.2	8.37	6.96	4.49
November.....	55.4	46.5	65.0	3.20	4.90	1.80
December.....	49.0	40.4	55.3	4.23	6.09	3.73
Monthly Average.....				4.11	6.00	3.47
Annual Average....	65.1	56.3	70.3	49.28	71.71	41.35

NOTES ON THE TABLE.

The months, as to average temperature, show the following order: (1) January 48.4 deg.; (2) December 49; (3) February 52.7; (4) November 55.4; (5) March 57.4; (6) April 64.5 (the monthly average of April being nearest the annual average temperature); (7) October, 67.5; (8) May 72.4; (9) September 75; (10) June 77.9; (11) August 79.3; (12) July 81.8.

They divide off as to nearly equal averages thus: 1. January and December; 2. February and November; 3. March, April and October make a triplet; 4. May and September; 5. June, August and July, another triplet.

As to RAINFALL in the State, the order of monthly rainfall is as follows: (1) August 5.31 inches; (2) March 4.91; (3) April 4.75; (4) January 4.63; (5) September 4.45; (6) December 4.23; (7) July 4.13; (8) June 4; (9) February 3.57; (10) October 3.37;

(11) November 3.20; (12) May 2.72. Occasionally June ranks much higher, being one of the most rainy months.

The least autumn rainfall (September, October and November) reported is in Macon, 7.10; LaGrange 7.88. The least July fall, Rome, 2.51. The greatest average autumn fall, Rabun Gap, 18.01. The greatest July average fall, Americus, 5.80.

These are the averages of five or six years. The data preserved by the Department of Agriculture are of great value. Anything which contributes to our reasonable foresight of the probabilities of rainfall affects the most important condition of all agriculture. Foresight of temperature changes, though not of fully equal importance to the crops, is also of great utility.

It is surprising to see the remarkable and reliable changes in temperature exhibited as we study the tables. We have put upon a map of Georgia the exact figures derived from Col. Redding's tables. They correspond with much accuracy to what we would expect as to annual and monthly averages. As we come south there is a gradual increase of a degree or two; as we come to a lower elevation a like increase of a degree or two; and when we lessen both factors, latitude and elevation, the change is made with corresponding rapidity. Start with Rabun Gap, 39.5 in January; Leo, a few hundred feet lower, shows 41.8; Gainesville 43.8. As we come down, Athens 44.9; LaGrange 45.6; Thomson 46.9; Macon 50.5; Americus 51.6; Brunswick 54.1. Thus does the range creep up. So with the months: January 41; February 45; March 50; April 59; May 66; June 73; July 77—the maximum; then as gradual a decline. It is like the effect of time showing the age of a man—while gradual, it is sure. Age sprinkles its snows with considerable impartiality; and so it is, too, with climatic conditions, they seem to follow a law.

The rainfall is more variable, and its conditions, while even more important than temperature, are less understood and less capable of prediction.

To illustrate the annual, monthly and daily range, take the observations of the Signal Service office in Atlanta:

	Highest.	Lowest.	Range.
1882. Annual	93.2	11.5	81.7
Monthly			52.5
Daily, average,			15.

Sunrise usually marks the lowest point; 2 p. m. nearly the highest. The extreme range, for a term of years, would be from about 110 or 115 in the Okefenokee Swamp, to perhaps 20 below zero in the mountains of Northeast Georgia; aggregate range, 135 deg.

In January, 1879, the greatest range in twenty-four hours was 29 deg., the least 6, mean, about 15. The highest point was 73, the lowest 9, range 64; In 1879: highest 97, lowest 9, range 88.

Mr. A. R. McCutchen instituted an interesting observation, comparing the climate of the table land of Pigeon mountain in county to that of the valley, four miles off and 1,000 feet lower, with the following result, July, 1880:

Place.	Elevation.	Max.	Min.	Mean.	Daily range
Dry Creek Valley	967	95	61	77½	16
Pigeon Mountain	1968	88	63	74½	10½
Difference	1001	7	2	3	5½

Observe, the climate on the mountain is *more uniform*, the extreme heat less, and also the extreme cold, and the daily range 5½ deg. less.

Variations of temperature are illustrated thus, in Washington, Middle Georgia, 8 a. m.:

Year.	Month.	Highest.	Lowest.	Range.
1863.	December	57	23	34
1864.	January	44	8	36
	November	66	16	40
1865.	January	40	19	21

1864—Very cool summer; sleet in April; June 13th, 14th and 15th, fires needed; in July, at or below 75 deg. fifteen times; December 7th, 73 deg. at noon; 18th, 69 deg.

1865—January 23d, near 70 at noon; a delightful week after this. August, 69 to 76 deg.; September 56 to 60 deg., very cool.

Table Showing Monthly Changes of Temperature.

PLACE:	DATE.		HIGHEST DEGREE.			LOWEST.		
	Year.	Month.	7 A. M.	2 P. M.	9 P. M.	7 A. M.	2 P. M.	9 P. M.
Tallulah.....	1881	July....	76	96	78	56	75	60
Rabun Gap.....		Janua'y	46	62	53	13	30	20
		July....	76	99	77	64	72	61
Ellerslie.....	1881	Janu'ry	51	53	.....	15	20	.....
		July....	85	93	.....	70	73	.....
Gainesville.....	1881	Janu'ry	49	59	51	13	28	24.6
		July....	69	90	83	53	69	64
LaGrange.....	1881	Janu'ry	51	62	60	16	26	26
		July....	86	103	90	70	79	70
Macon.....	1881	Janu'ry	52	65	55	25	34	20
Thomasvil'e		July...*	85	99	91	66	80	70
	1881	Janur'y	61	68	60	30	39	35
Brunswick		July....	85	98	91	73	78	76

Table of Diurnal Changes.

PLACE.	DATE.		Difference bet. 7 a.m & 2 p.m.	
	Year.	Month.	Mean.	Greatest.
Ellerslie, on Lookout Mountain.	1880	{ January.....	7	38
		{ Ju'y.....	9½	27
Rabun Gap.....	1880	{ January....	18½	48
		{ July.....	15	31
Dry Creek Valley.....	1880	{ July.....	16	34
Pigeon Mountain.....	1880	{ July.....	10½	25
Rome.....	1880	{ January.....	14	40
		{ July.....	16	31
Gainesville	1880	{ July.....	13	26
Macon... ..	1880	{ January.....	16	45
		{ July.....	10	25
Brunswick	1880	{ July.....	11	25

From a valuable table furnished by Mr. S. C. Emery, the Signal officer at Savannah, we derive the following information. The observations embrace thirteen years, from 1872 to 1884 inclusive. The mean annual temperature for the thirteen years is 67 deg.; the highest mean annual, in 1879, is 69.4; the lowest, in 1872, is 64.1. The highest reach of the thermometer was in July, 1879, 105 deg., the lowest in January 1873 (and also 1884), 18 deg. The thermometer reached 100 deg. seven times in the thirteen years, viz: June 1880, July 1875, 1876, 1877, 1879 and 1881, and August 1878. It went to 20 deg. or below but three times. The highest mean

for any month was in July, 1876 (the same for 1881), 84.7; the coolest July mean 79.1. The coldest January means were, 1872, 45.5; 1884, 46 deg. The warmest January means were, 1876, 56.2; and 1880, 59.1.

The Savannah RAINFALL for the thirteen years shows a mean of 52.43 inches. The heaviest was in 1876, 64.83; the lightest, 1881, 38. The maximum monthly rainfalls were, June 1876, the enormous amount of 18.80; August 1872, 12.31; March 1872, 10.18. The least monthly fall reported, November 1880, 0.58 inch. The rainfall, in the thirteen years, fell six times below an inch in a month's time.

MEAN ANNUAL TEMPERATURE.

The Census Atlas of 1870 gives much valuable information on this subject, visible at a glance of the eye. It gives Isothermal lines for every four degrees of temperature, say 40, 46, 48, 52 and so on.

The Atlas of 1880 gives revised results for every five degrees—40, 45, 50, 55, and so on to 75 degrees.

Between these are climate belts, of which in the United States nine belts are represented.

SURPRISING RESULTS.

The study of these temperature maps yields some very unexpected results, illustrating the necessity of *observation* as the basis of fact.

Of the nine belts in the United States, eight are represented in Georgia, so varied is our climate. No other state gives the same variety, unless perhaps on the Pacific coast, on the Rocky Mountain western slope.

The only belt not represented in Georgia is found at the very tip of Florida, and nowhere else in the Union, with a mean annual temperature of between 75 and 80 degrees.

Of the eight climates represented in Georgia, the lowest in temperature is below 40 degrees; the highest between 70 and 75, a remarkable range, unmatched east of the Mississippi river. North Carolina has the next range, with six belts, lacking the two highest.

That South Georgia should correspond in climate with northern

Florida is not surprising. But who would suppose that parts of Georgia have the same climate with the most northern extreme of Maine, and the bleak northern part of Washington Territory and the upper great lakes?

A still more remarkable result is to be found in the distribution of maximum temperature. Where would one look for it? Certainly not in Montana. Yet, just here it is to be found. One of the very few spots where the maximum temperature is 110 to 115 degs., is in Montana, while the southern extreme of Florida shows a maximum of between 95 and 100.

So necessary is it to draw our facts not from conjecture, but from observation. The parallel of 47° north latitude passes through the spot in Montana, with its Rocky Mountain surroundings, when the highest temperature is 110 to 115. The parallel of 25½°, just two degrees above the Tropic, passes through lower Florida, with no elevation above the sea, and yet a maximum of 95 to 100.

It takes actual experience to appreciate the enormous difference when one is near the edge of possible endurance of heat. At 110 to 115 one needs blankets to keep the heat out, as becomes necessary in the hot winds of the desert. It is 10 degrees higher than the heat of south Georgia; 15 than that of south Florida, with the moderating influence of the sea.

We see, therefore, in Georgia, a range of climate extending from below 40 to above 70 of mean annual temperature—equivalent to the average range of 15° of latitude, instead of 4½.

A climate of below 40 is above the range of trees—only shrubs appear. The mountain peaks have acquired the name of "balds," the Rabun bald, the Brasstown bald, etc. On these summits arctic insects are found. Such is the reign of law. Of this belt Georgia has but a bare patch, however, extending into North Carolina. It does not appear even among the Virginia mountains, though we should certainly expect it there. Spots of it are found in Oregon, Washington Territory and in the northern tip of Maine. The Adirondacks, the Green and White Mountains and the Rocky Mountains show patches of it scattered sparsely here and there, only chiefly in the far north, as on the border of Lake Superior.

<input type="checkbox"/>	Below 72°
<input type="checkbox"/>	72° to 76°
<input type="checkbox"/>	76° to 80°
<input type="checkbox"/>	80° to 82°

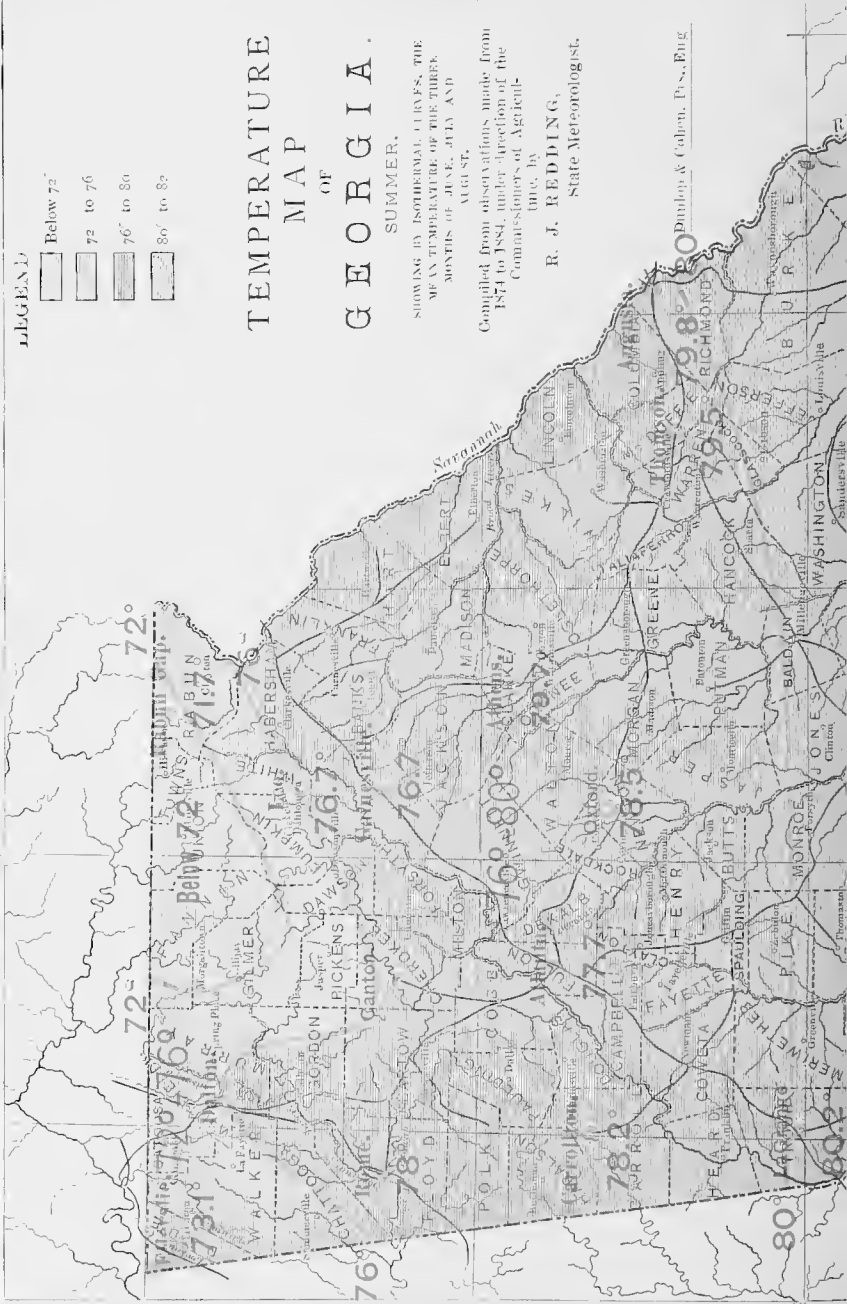
TEMPERATURE
MAP
OF
GEORGIA.
SUMMER.

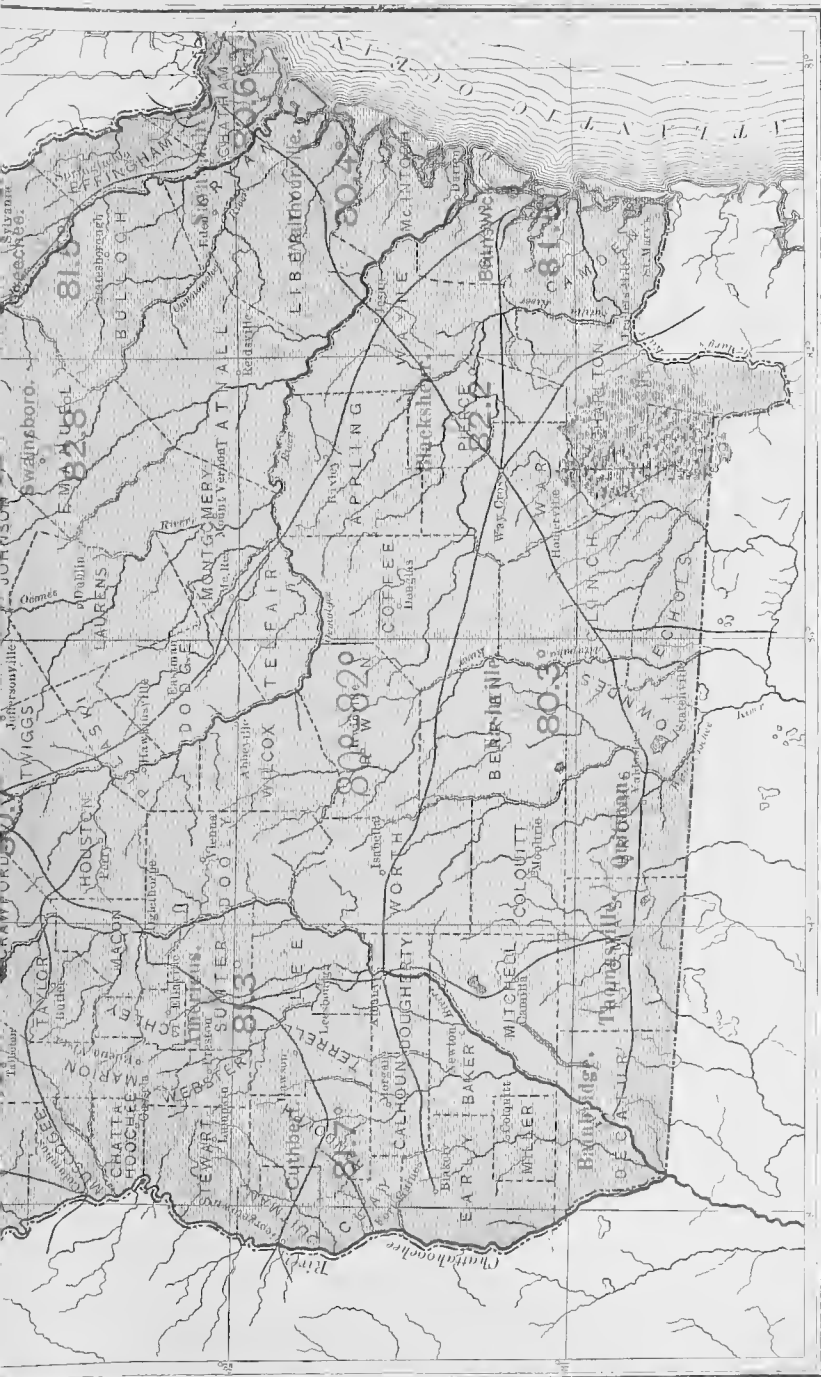
SHOWING ITS ISOTHERMAL CURVES, THE
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Compiled from observations made from
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Commissioners of Agriculture,
Iowa, by

R. J. REDDING,
State Meteorologist.

Dunlop & Colson, P., Eng.





82° 82° 82°

LEGEND

- 10 to 12 Inches.
- 12 to 16 Inches.
- Over 16 Inches.

RAIN MAP OF GEORGIA.

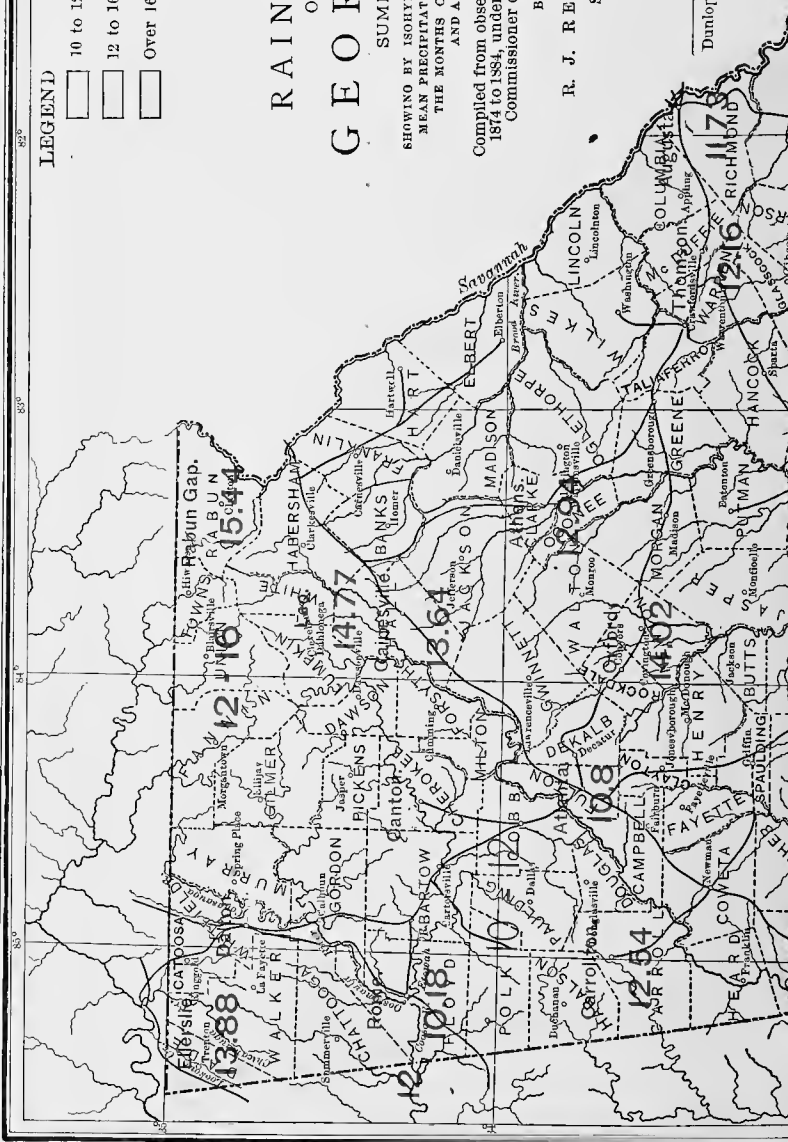
SHOWING BY ISOHYETAL CURVES, THE
MEAN PRECIPITATION OF RAIN FOR
THE MONTHS OF JUNE, JULY
AND AUGUST.

Compiled from observations made from
1874 to 1884, under direction of the
Commissioner of Agriculture.

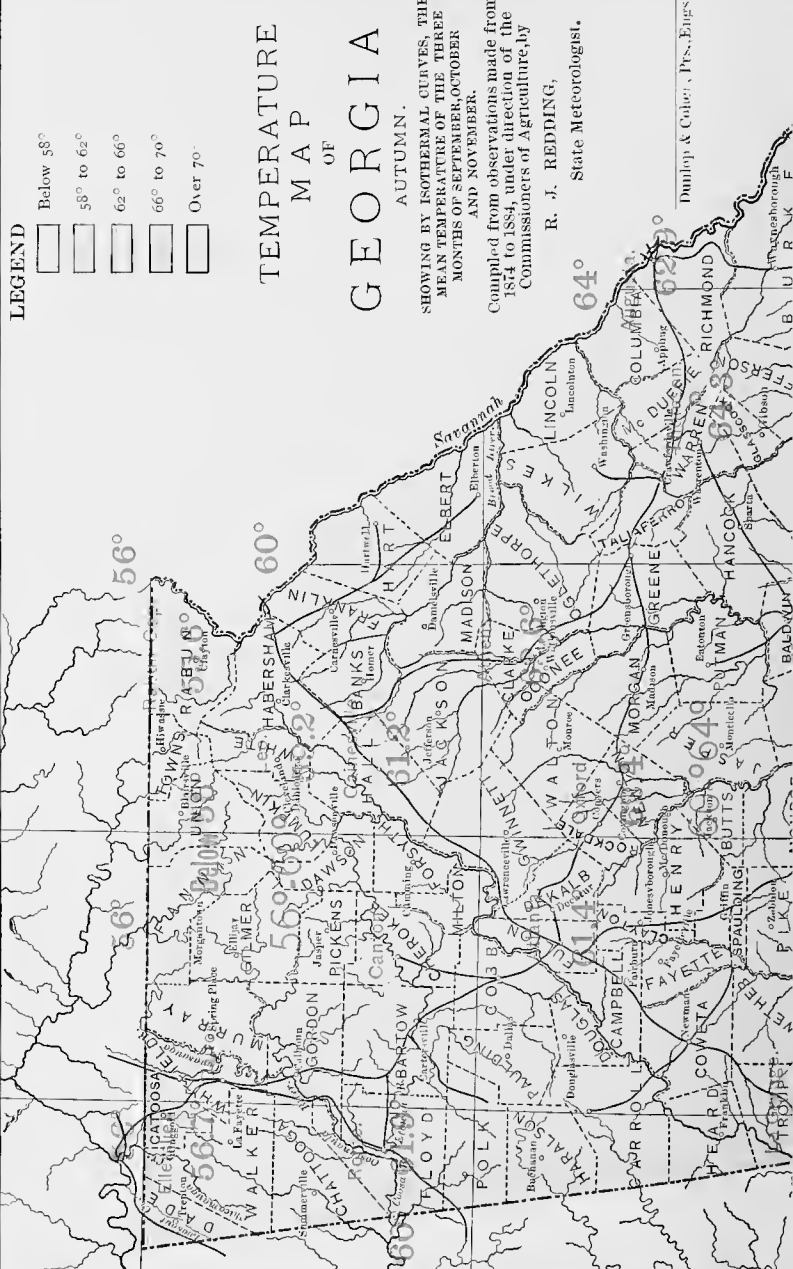
BY

R. J. REDDING,
State Meteorologist.

Dunlop & Cohen, Prs., Eng.



155° 156° 157° 158° 159°



LEGEND

-  Below 58°
-  58° to 62°
-  62° to 66°
-  66° to 70°
-  Over 70°

TEMPERATURE MAP OF GEORGIA

AUTUMN.

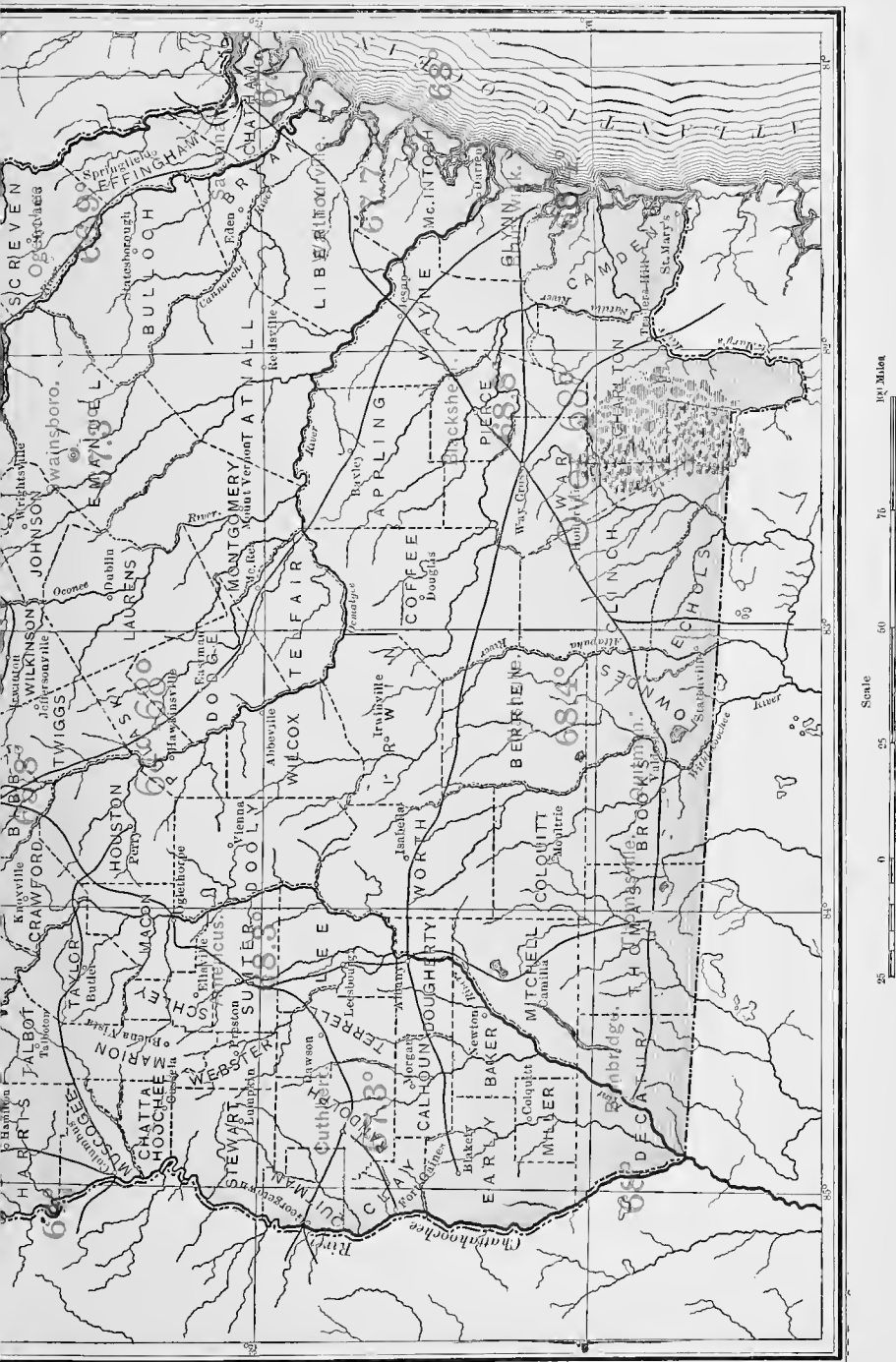
SHOWING BY ISOTHERMAL CURVES, THE
MEAN TEMPERATURE OF THE THREE
MONTHS OF SEPTEMBER, OCTOBER
AND NOVEMBER.

Compiled from observations made from
1874 to 1884, under direction of the
Commissioners of Agriculture, by

R. J. REDDING,

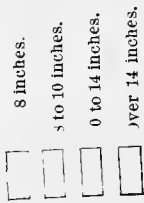
State Meteorologist.

Dunlap & Colet, Pres., Engrs.





LEGEND



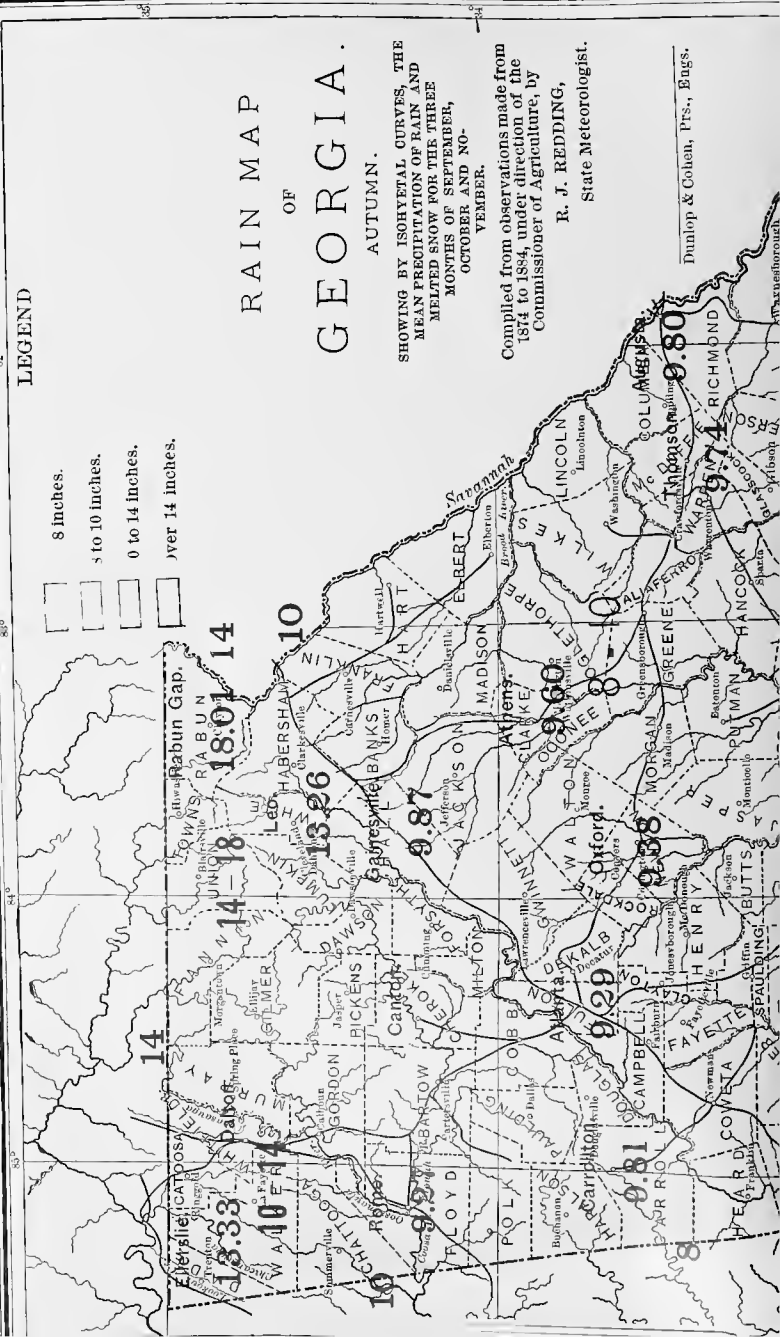
RAIN MAP OF GEORGIA. AUTUMN.

SHOWING BY ISOHYETAL CURVES, THE
MEAN PRECIPITATION OF RAIN AND
MELTED SNOW FOR THE THREE
MONTHS OF SEPTEMBER,
OCTOBER AND NO-
VEMBER.

Compiled from observations made from
1874 to 1884, under direction of the
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The next zone, between 40 and 45 degs of mean annual temperature, corresponds in climate with *upper New England*, upper New York, and the mountain region of Virginia. It abounds about the great lakes, and among the Rocky Mountains. Of this also, Georgia has but a small share, on the mountain sides, below the summits.

Between 45 and 50, Georgia is represented somewhat more largely, this zone corresponding with considerable areas in New York, Pennsylvania, Ohio, and so on West.

The zone between 50 and 55 is still narrow in Georgia, and runs in a narrow strip through North Carolina and Virginia, as far as New Jersey.

We come now to the larger areas. The fine climate between 55 and 60 embraces a considerable region, two or three times as large as all the preceding put together. This zone passes through South Carolina and North Carolina, and ends in Virginia. Two of the weather stations lie in this zone. Rabun Gap, 2,168 feet above sea, level, with a mean temperature of 56.3, and Ellerslie, perhaps a little higher, 2,400, with a mean of 56.5.

Nearly all Middle Georgia lies in the next zone, between 60 and 65. Its lower limit corresponds with the mean temperature of the State. It is the Piedmont region, extending into Virginia; westward, it embraces upper Alabama, Mississippi, Louisiana, Texas, West Tennessee and Arkansas. The following stations are embraced in it: Leo 60.1, Rome 61.9, Gainesville 61.3, Atlanta 61.4, Carrollton 62, Oxford 62.6, Athens 63, Augusta 64, LaGrange 64.1, and Thomson 64.7. Southern Georgia occupies chiefly the zone between 65 and 70 of mean annual temperature. Its climate corresponds with that of lower Texas, Louisiana, Mississippi, and upper Florida. It embraces the following stations: Macon 66.1, Swainsboro 67, Ogeechee 67.3, Nashville 67.9, Cuthbert 68.1, Americus 68.2, Walthourville 67.6, and Brunswick 68.7. Blackshear, Pierce county, alone of the stations, touches the next zone, with a temperature of 70.3.

On the whole, the map of the mean annual temperature of Georgia is very spotted. The isothermal lines limiting them vary widely

from parallels of latitude, running northeast along the axis of the mountain ranges, the factors bending them up an elevation and slope to or from the sun. Hence they run north more abruptly on the western and shaded side than on the eastern slope. The lines of temperature bend round the mountains.

There is in the climatic zones a reasonable approximation to the hypsometric areas and population, the climate being affected more argely by the elevation than by the difference of latitude.

JULY MEAN TEMPERATURE.

Georgia has on the Census Map but two broad belts. The Isothermal line of 80°, July temperature, running just above Augusta and Macon to West Point. Above this the temperature is given as between 75 and 80°; below it as between 80 and 85°. The upper part embraces nearly all of North and Middle Georgia. The lower, nearly all Southwest, East and Southeast Georgia. The upper corresponds with Virginia, Kentucky, lower Illinois, Missouri, Tennessee, North Carolina and South Carolina. The lower, with lower Kansas, the Indian Territory, Arkansas, Texas, Mississippi, Louisiana, West Tennessee and Northwest Alabama. The July mean temperature for the State is 81.8.

The table kept for the Department of Agriculture gives a somewhat nicer division, making two added zones. The July zone between 70 and 75 is represented by Rabun Gap 73.6 and Ellerslie 74.5. Between 75 and 80 are Stations, Gainesville 78.6, Lee 78.9, Atlanta 79.7—fewer stations than the Census Map would give. Between 80 and 85 they are much more numerous, embracing all the other stations save one, viz: Rome 80.3, Carrolton 80.6, Oxford 81, Nashville 81.8, Augusta 81.9, Athens 82, Newnan 82.2, LaGrange 82.9, Walthourville 82.9, Macon 83, Americus 83.2, Brunswick 83.3, Ogeechee 83.5, Onthbert 83.8 and Blackshear 84.2. The one station, Swainsboro, has the July temperature of the next zone over 85° viz: 85.4.

JANUARY MEAN TEMPERATURE.

The Census Atlas shows four zones; the Department Tables add another, making five. By the census, the four belts are nearly

equal, the first with a January temperature of 35° to 60 degrees, embracing North Georgia, with approximate accuracy, and running northeast into South Carolina, and Virginia; Northwest into Tennessee and Kentucky. Between 40 and 45 the larger part of Middle Georgia, corresponding with South Carolina and North Carolina, but scarcely reaching Virginia. The next zone, between 45 and 52 slopes less to the northeast. It embraces about one-fourth of the State. The fourth zone embraces central parts—the Southern section. By the Department Reports Blackshear, 55.7, is in a fifth zone.

The following stations are embraced in the several zones :

- 1.—In the coldest, Ellerslie 38.4, Rabun Gap 39.5.
- 2.—Lee 41.8, Rome 42.8, Atlanta 43.1, Carrollton 43.1, Gainesville 43.3, Oxford 43.9.
- 3.—LaGrange 45.6, Newnan 56.9 Augusta 46.9, Swansboro 47.4.
- 4.—Macon 52.5, Cuthbert 51.4, Americus 51.6, Nashville 52, Walthourville 52.6, Brunswick 54.1, Ogeechee 54.3.
- 5.—Blackshear 55.7.

The mean January weather for the State is 48.4.

MAXIMUM TEMPERATURE.

Georgia exhibits on the Census Map but two belts of maximum temperature. 1. Between 95 and 100. 2. Between 100 and 105 maximum. In the first belt North Georgia lies. The Isothermal line between the two runs almost due northeast, and the belt extends into Maine, (a separate spot includes Wisconsin and part of Iowa) including New England, New York, Pennsylvania and Ohio and so on down.

The lower belt includes the larger part of Middle and all of South Georgia. It extends Northeast to include Connecticut and all the Coast Line, New Jersey, Maryland, etc. It embraces a sweeping territory in the great Mississippi Valley, including as far up as Dakota, Iowa, Michigan, Illinois and Indiana, and so down.

No part of Georgia is embraced in the zone between 105 and 110, yet Maryland, Texas and New Mexico are in it, and strange to say, Montana, Nebraska and Kansas. Between 110 and 115 no part of

Georgia but a spot in Montana and spots in Idaho and Nevada and Arizona. Above 115, spots are in Arizona and South California.

STATIONS IN GEORGIA.

In 1881 the maximum points were as follows, all occurring in February: LaGrange 103, Macon 99, Brunswick 98, Tallulah 96, Ellerslie 93.

In 1879 in Savannah in July the thermometer reached 105.

MINIMUM TEMPERATURE.

Four zones are represented in Georgia. From 10 to 20 below zero in Northeast Georgia, reaching north into Virginia, Ohio, etc., and embracing the intermediate States in the zone. From zero to 10 above the rest of North Georgia is included. Between zero and 10 fully two-thirds of the State lies, and a narrow strip in Florida and coast to between 10 and 20.

STATIONS IN GEORGIA.

In 1881, January, the lowest report at Rabun Gap was 13, Ellerslie 15, Gainesville 18, LaGrange 16. Savannah in January 1873 and 1884, 18 degrees.

NOTES ON MAXIMUM AND MINIMUM TEMPERATURE.

The variations from mean temperature in Georgia extend downward (towards lower temperature) more than upward. Thus the mean being 65 the extreme heat at 105 varies from the mean by 40 degrees; the extreme cold, about 15 degrees below zero varies from the mean about 80 degrees—twice as much as the variation in the other direction.

This rule, of varying down rather than up, from the mean seems to be general. Even in Dakota, for example, the mean temperature being about 40. Foreigners prefer a belt five degrees colder than natives, and colored people a belt 10 degrees colder than native whites, and 15 degrees colder than foreigners.

JULY TEMPERATURE.

The densest total population and foreign population are both in the belt between the isothermal lines of 70 and 75 degrees. The colored between 80 and 85, 10 degrees higher.

JANUARY TEMPERATURE.

The densest total and foreign are in the belt between 20 and 25 degrees; the colored much higher, between 45 and 50; being 25 degrees higher; 40 and 45 degrees with nearly one-fourth of the population. In Georgia the most populous belts are of a higher range, by 10 degrees, viz: the most populous between 60 and 65, and next to it the 5 degrees between 55 and 60.

The tendency of the foreign population is towards the colder climates; that of the colored towards the warmer. Thus, of the aggregate population, the belt between 50 and 55 is most densely settled by the foreign people: that between 45 and 52, of the colored; that between 60 and 65 the maximum is 105, difference 65; the minimum is 50 below zero; difference downward 85 degrees, 25 more than the variation from mean temperature upward.

DISTRIBUTION OF POPULATION ACCORDING TO TEMPERATURE.

MEAN ANNUAL TEMPERATURE.

In the United States a range of 10 degrees will cover three-fifths of the population, viz: that between 45 and 55. The belt of five degrees between 50 and 55 is the most populous, embracing about one third of the whole. Next is that between —

RAINFALL.

The rainfall for twelve months it is estimated would, cover the earth's surface at the equator 10 feet deep; at the tropics 6 feet; in Georgia, 4 feet; at 45 degrees latitude, 3 feet; at the poles, 1 foot.

The rainfall on an acre of ground is enormous in bulk and weight. An inch of rain on an acre would weigh 270,000 pounds, or 135 tons. To haul it would require about 100 two horse wagon loads. The natural supply in Georgia averages about 50 inches, and it would require about ten loads a day every day in the year to replace the prodigality with which nature furnishes us gratuitously.

The distribution of rain is more important than the quantity which falls, and the summer rainfall is by far the most important.

The annual rainfall for five years in Macon and Atlanta is given below for the years 1871-1875 inclusive :

	Mean.	Max.	Min.	Month.	Max.
Macon	54.9.	69.1.	50.3.	Sept, 1871.	12.
Atlanta	53.2.	60.1.	49.9.	April, 1874,	10.4

The summer rains in Athens, Georgia, for same years were as follows : 1873, 8.94 inches ; 1874, 11.76 ; 1875, 12.97 ; 1876, 19.77.

In June 1876, in Savannah, 18.8 inches fell.

The following table shows the summer rainfall for certain years, and also its distribution :

SUMMER RAINFALL.

ATLANTA, GA.						WASHINGTON, GA.						
1882.						1863.			1864.			
Day.	May.	June.	July.	Aug.	Sept.	June.	July.	Aug	May.	June.	July.	Day.
1		.23		.12				.2				1
2			.13	.01	.04	.4						2
3			1.80	.84	.26	.5				.6		3
4			.97	1.05						.5		4
5				.20						.8	.5	5
6							.7				.2	6
7					.01						.2	7
8	.36	.15		.03	.36		.2				.1	8
9	.01	.24		.04	.40					.5	.3	9
10	.01	.01		.25	2.30	.2			.6	.9	.2	10
11	.61	.30	0.70	.14	.03	.5				.4	.2	11
12	.15			.83		.6	.2				.3	12
13	.06	.06		.04		.3				.1		13
14	.01									1.2		14
15		1.45						.3				15
16		.10					.8					16
17		.43	.04	.45					.4	.4		17
18		.07	.54						.9	.5		18
19										.8	.5	19
20										.6	.3	20
21	.10		.01								.4	21
22	.65	.07	.63			2	.3	.3				22
23												23
24			.09						.5			24
25			1.39	.74					.4			25
26			.02	.39					.6			26
27			.08	.09							.2	27
28	.47		.33			.8	.8			.4		28
29	.01	.02		.53	.11						.7	29
30		.03	.20	.07			.1		.2			30
31	.58		.41	.04		.1						31
Total...	3.02	3.22	6.61	5.86	3.51							

Savannah—1.60, 7.95, 3.53, 5.23, 7.42.

NOTE.—The year 1882 was one of the finest crop years ever known in Georgia. Note therefore the distribution of the rains. There were no long intervals, yet no excesses. It was especially adapted to our red clay lands, which have in them abundant elements of fertility, but need water for their solution.

MEAN ANNUAL RAINFALL.

Classifying according to the number of inches, beginning with 60 degrees and over, then between 55 and 60, and so on, we have six grades, represented by the following stations in Col. Redding's report, viz :

1. Over 60 inches: Rabun Gap, 71.7; Ellerslie, 64; Lee, 63; representing a small mountain district only.

2. Between 55 and 60 inches, no stations.

3. Between 50 and 55 inches: Gainesville, 55; Athens, 55; Carrollton, 53; Savannah, 52; Oxford, 51; Blackshear, 51; representing perhaps 15 per cent. of the area of the State.

4. Between 45 and 50 inches: Atlanta, 49; Outhbert, 49; La-Grange, 49; Rome 47; Brunswick, 47; Americus, 47; Nashville, 46; representing perhaps 30 per cent. of Georgia.

5. Between 40 and 45 inches: Macon, 45; Thomson, 45; Wal-thourville, 45; Augusta, 43; Ogeechee, 41; representing about half the State.

6. Between 35 and 40 inches: Greensboro alone, 39.

These observations enable us to correct the Census Atlas, which gives but three grades. No grade is given for over 60 inches.

The grade between 50 and 55 is over-stated, and no grade below 45. The general result shows *less* annual rainfall than is represented in the Census Atlas.

The rainfall of Georgia, even after this reduction, is still considerably above the average rainfall of the United States, even east of the Mississippi river; the Eastern rainfall far exceeding the Western.

TABLE OF MEAN ANNUAL RAIN-FALL.

Inches.	Per cent. of Area.		Population per Square Mile.	
	United States.	Georgia.	United States.	Georgia.
1 over 60		1		
2 55 to 60	5.62	3	20	30
3 50 to 55	8.60	15	22	35
4 45 to 50	25.43	30	58	35
5 40 to 45	22.64	50	40	22
6 35 to 40	20.00	1	39	12

SUMMER RAIN-FALL.

The average for the State being 13.44, the variations in sections are not wide. The lowest station is Rome—10.18 inches; the highest Barnesville—16.57. The quantity is everywhere abundant, the only needful condition being its proper distribution.

WEATHER NOTES.

The following notes are not given because they can lay claim to any completeness, but rather as a rough start, intended as a nucleus about which other information may begin to gather.

HEAT AND COLD.

1757--In Savannah 102 deg.

1816 - Noted as the cold summer.

1827-8--Warm winter. Cotton ratooned, but did not bear well.

1835--Cold winter.

1839--Cool summer.

1842-3--Winter mild till February, then very cold; five snows in March.

1844--Cool summer.

1845--July 4, Crawfordville, 98 deg.; Cambridge, Mass., 105 deg.

1851--January 21, in Crawfordville, 3 deg.; in Athens, 7 deg. Snow eight inches; ground frozen ten inches.

1851-2--Mild winter. Cotton blooms, and some yields after Christmas.

LEGEND



TEMPERATURE MAP OF GEORGIA.

SHOWING BY ISOTHERMAL CURVES, THE
MEAN TEMPERATURE OF THE THREE
MONTHS OF DEC., JAN., AND FEB.

Compiled from observations made from
1874 to 1884, under direction of the
Commissioners of Agriculture, by

R. J. REDDING,
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Huntlop & Cohen, Prs., Engs.









84° 20°

84° 20°

84° 20°

LEGEND

-  8 to 12 Inches.
-  12 to 16 Inches.
-  16 to 20 Inches.
-  Over 20 Inches.

RAIN MAP OF GEORGIA.

WINTER.

SHOWING BY ISOTHERMAL CURVES, THE
MEAN PRECIPITATION OF RAIN AND
MELTED SNOW FOR THE MONTHS
OF DEC., JAN., AND FEB.

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1854—Hot summer.

February 8. Cold Saturday, Washington, Ga., 4 degrees below zero; Crawfordville, 8 deg. below; Athens, 10 deg. The coldest season for one hundred years. At the North, the mercury froze in many places. In Liberty county, fig trees nearly 100 years old were killed—(this a test for 100 years.) Many persons were frozen. Dr. Poullain, of Greensboro, refers to a visit from Judge Longstreet at this time, nearly frozen, and too cold for an hour to join the family at supper. In March, deep snow, 8 inches in Western Georgia.

1837—May 29. Hard storm in Wilkes; hail lay on the ground, in spots, twelve days.

1855—April 19. Lexington, 97 deg.—92 at dark. Hottest day of the year. May 9-10, 50 deg.; cool week. June 3-4, 59, 57.

1857—January 19. Washington, Ga., $\frac{1}{2}$ deg.; New York city, 18.

1858—July 19. Washington, Ga., 99 deg.; 10 p. m., 90 deg.

1-59—Hot summer; 97-103 deg. Winter pleasant.

1860—July 12. Crawfordville, 102 deg. Mild winter.

1862—Hot August.

1863—Cool June.

1865—Pleasant winter. Warm Christmas.

1866—February 15, 4 deg.

1871—January 22, 68 deg. at sun down. February 12, 64 degrees at 9 p. m. March 7, 78 deg. August 5, 98 $\frac{1}{2}$ deg. December 25, 74 deg.; 26th, 75 deg.

1872—April 29, 89 deg.

1873—Hot summer. Hot days in April.

1875—November 15, 78 deg. at noon. November 16, 80 deg. at 7 a. m. Fell at night to 38 deg., 42 deg. November 17th, ice. 19th, 70 deg; 20th, 77 deg.; 21st, 75 deg.

1876—January 21st, 71 deg.; 13th 20 deg; 23d, 74 deg. at 5 p. m.

EXCESSIVE RAINS AND FRESHETS.

1796—The Yazoo freshet.

1817—A wet year.

1840—Freshet in May and September—the latter called the Harrison freshet. Water at Augusta bridge, 37 feet 10 inches above low water.

1847—Wet year. Also 1848.

1851—April freshet.

1852—August 18th; Augusta bridge, 37.5. Athens bridge carried away.

1864—June, freshet.

1865—January 7-10, freshet.

DROUGHTS AND DRY YEARS.

1818—Excessive drought. Cotton 32 cents.

1830, 1838—Dry years.

1839—Excessive drought, with heat, yet a fine crop made. Rains began July 5th. Stalks of corn low; ears bending over, reached the ground. Savannah river, at Augusta, so low, a man could cross it by leaping from rock to rock. Mr. Shultz planted and raised turnips in the bed of the river. Drought did not break up till March, 1840—probably, in the opinion of Hon. A. H. Stephens, not 3 inches of rain from May till October: yet this well-timed, and crops of corn and cotton both remarkable. Yellow fever in Augusta.

1845—Dry, yet good crop year.

1860—Dry spring till April 16.

1861—Drought in McDuffie county 90 days.

866, 1869—Dry years.

DEEP SNOWS.

1775—November 25. Snow 18 inches.

1835—February and March, much snow—one 8 inches deep.

1846—Great sleet.

1846-7—Much snow.

1849—April 15. Sleet killed corn and wheat; yet good crop made.

1851—Snow 8 inches.

1856—January. Hail, some four or five weeks on ground.

1857—Hail storm, some twelve days on ground.

1864—Sleet in April.

1876—March 20. Sleet. Leaves killed on trees.

1882(?)—Snow 8 inches deep at Barnett, 10½.

STORMS.

1804—1822.

1856—On coast.

- 1868—Storm in Madison, Ga.; and in an hour in Washington, Ga.
 1875—Cyclones. The first great cyclone, March 20, entered Georgia in Harris county, above Columbus; and passing near Milledgeville and Sparta, struck Camak, and left the State a little North of Augusta, passing across the State in about three hours. The second cyclone pursued quite a similar path. The storm of 1804 is said to have followed a like course, about 10 miles from same track.

EARLY AND LATE FROSTS.

- 1803—May. Cotton killed.
 1813—Frost nearly every month.
 1828—April 6th, 26 deg. Corn killed.
 1848—Frost, May 8.
 1849—April 15, sleet.
 1851—Frost, May 6.
 1856—May 10, frost.
 1857—April 6, sleet. May 5, frost.
 1859—April 6, ice.
 1872—October 15, killing frost.

SOME GOOD AND BAD CROP YEARS.

- 1839—Good; so 1842, 1843. 1845, 1848, 1852, 1855, 1858. First rusting of oats in Georgia.
 1860—Best cotton crop to that date.
 1862—Best wheat crop. 1867, 1870, 1874.
 1882—Best general crop—cotton, corn, small grain, vegetables, fruits, etc. Summer rainfall, 15 inches. Bad years, 1818, 1866, 1883.

CERTAIN OTHER DATES.

- 1835—Meteors.
 1817, 1839, 1854, 1874, yellow fever years.

FRUITS, ETC.—1865.

- April 16. Forest leaves about two-thirds grown.
 May 2. Strawberries late. Sometimes ripe 25th March.
 15th, raspberries. 27th, cherries. 29th, plums.

June 1. Wheat cutting. 12th, figs ripe. 27th, peaches.
 July 5. Chinese clings ripe. 7th, 97 deg. 29th, Celestial figs.
 September 21st, a perfect day.
 October 25th, red leaves on black gum. December 3d, one late fig.

SOME CROP NOTES.—1868.

Washington, Ga.—March 11, 12, 13, severe cold. Corn planting begun.

April 6, cotton planting. 8, frost. 13, very cold. Rain for ten days.

23, planting renewed. 27-8, rain again. Rust in wheat.

May 7. Tornado, narrow track. 9th, 48 deg. at noon. Rust bad.

June 2. Wheat cutting. 4, cotton nine inches high. 25 first peach. 26, first cotton blows. Dry month.

1868—July 1. Best cotton thirty inches high—average eight or ten 23, Celestial figs. 28, cotton pruning; best stalks 45 to 75 forms.

August 4. Second crop figs. 15th, cotton bolls dry. 24th, after rain, cotton forming.

September 18. No. of bolls on five yards of a row of cotton, counted in thirteen places, average number, 200—40 to a running yard.

October 23-4. Slight frost.

November 2. Ice.

1869—Dry year. Protracted local drouths.

1870—A splendid crop year.

March 25 to April 4, rain stops work.

April 8. First cotton planted. 9th, rain stops work.

May 12. Best cotton, $3\frac{1}{2}$ inches high, four leaves. 17th, $5\frac{1}{2}$ inches high, six leaves. 26th, first squares on cotton.

June 8. Highest stalk fourteen inches; cotton average four or five inches. Corn eighteen inches. 10th cotton growing; average six inches high. 15th, corn and cotton roots examined—they fill the whole bed. 16th, best cotton twenty-four inches high. 21st, best stalks have twelve or fifteen squares. 22d, preserving blackberries. Figs ripe. 23d, first roasting ears. First cotton blows, 29th, best

stalks thirty-four inches high; fifty-four squares, two or three blows; average cotton ten or twelve inches. Marked a cotton blow, it became an open boll in thirty-eight days—August 6. 3d, cut corn forage.

July 1. On dinner table, common Irish potatoes, snap beans, beets, onions and okra. 2d, figs. 4th, average cotton, twelve or fourteen inches; some stalks fifty to eighty squares, hoeing up by 6th, bloom marked; opened in thirty-nine days, (August 14.) 9th, cotton boll weighing half an ounce. 10th, first katydid. 12th, cotton boll two-thirds oz.; average stalks, twenty to twenty-two inches, best, 100 to 120 squares. 14th, fine peaches 16th, Italian figs. 18th, 175 squares on one stalk, 216 on another. 25th, 93 deg.; some green bolls. 26th, 94 deg. 28th, highly manured cotton needs rain. 94 deg., in Porch 96½ deg., in Basement 88, in Sumter 130 deg.

August 6th, first open boll. 12th, good stalks in average rows. 15 to 25 green bolls. 15th, fodder pulling. 22d, cotton opening; blow marked July 5, opened in forty-eight days. 29th, rust on cotton; stalk manured; cotton needs rain. 31st, hot weather injures cotton; one stalk with nine bolls 20 dead forms.

COMPARATIVE CLIMATE.

Upon the climate of the cotton states, (Georgia being one of them), some useful comments are made by Dr. Barber, in his volume, entitled, "The Cotton Question." The cotton States lie in the warm zone, with a mean annual temperature of between 60 and 70 degrees. The climate west of the Alleghanies is about 3 degrees warmer than in the corresponding latitude east of the mountains. This arises from the warm winds of the Gulf coming unobstructed up the Mississippi basin.

The annual range of climate between the warmest weather and the coldest is greatest on the coast, and decreases as you go into the interior. It is given as follows, viz: At Vera Cruz, 12 degrees; Mobile, 27½; Galveston, 29; New Orleans, 30; Savannah, 31.75; Charleston, 31. In the interior it is greater: Vicksburg, 31.5; Natchez, 32.7; Augusta, 36; Columbia, 38. So far, Dr. Barber's observations.

In Georgia the average range is between 48.4 and 81.8, i. e., 33.4. At Rome it is greatest, 37.5. In Southeast Georgia least, 29.4. Georgia summers range from 75 to 95; winters from 40 to 66. The summer climate is enlivened by breezes.

On the climate of our sister State of South Carolina valuable tables are furnished in the manual for that State. The annual mean temperature is given at 65 degrees, the same as in Georgia. We append a brief summary of the results of observations made for a series of years. Highest temperature recorded: 1879, 104 degrees; lowest: 1885, 2 degrees. Summer mean, 76 degrees; winter, 54.

By reason of difference of latitude, there should be a difference of two or three degrees in the mean State temperature of Georgia and South Carolina. More records have been preserved, however, in lower South Carolina than in the upper parts of the State.

RAINFALL IN SOUTH CAROLINA.

	Highest.	Mean.	Lowest.
Annual		50.77	
Spring	26.57	9.96	2.48
Summer	31.34	15.90	6.11
Fall	27.16	15.53	4.80
Winter	16.36	8.99	3.73
Number of days	150	86	30
Barometer	30.794	30.097	28.812

The prevailing winds are south-west for 21 out of 26 years. In that period 1 year north west, 1 year north-east, 1 year east, and 2 years south winds prevailed.

In a considerable number of years of observation the average period of the latest spring frost was about April 10; the earliest cessation of frost, March 23, 1862. The average of fall frost, October 25, the latest November 23, 1846.

The average interval between last spring frost and earliest fall frost, 198 days; longest interval, 255 days.

The South Carolina tables are well worth our study, extending over a considerable period not embraced in our own, and with great similarity of climate.

ISOTHERMS.

The isotherm of 65 degrees mean annual temperature which passes nearly centrally through Georgia, runs level almost like a parallel of latitude near $32\frac{1}{2}$ degrees.

The isotherm of 60 degrees—that of North Georgia—curves around the mountains, and clasps them in form like a capital letter U, with the lowest part in Georgia. It passes near Norfolk, Virginia, Raleigh, North Carolina, Greenville, South Carolina, and Atlanta, Georgia, near Nashville and Memphis, Tennessee, and reaches the Pacific in latitude 34. On the other continent it passes through Spain, Italy and Greece, in Europe; Syria, Persia, Thibet, and China, in Asia.

The most important, however, of all the isotherms to us is that of July temperature, the mean for July in Georgia being 82 degrees nearly. The Augusta summer climate is near the average for the State. This passes near ancient Carthage, above Egypt, into Palestine. We have the summer climate of Palestine, the Holy Land, and of Jerusalem, the sacred city; the winter climate of Rome.

COMPARISON WITH MORE DISTANT PLACES.

The latitude of Snehow, China, corresponds with that of lower Georgia, say of Darien. It is 31, 25, 23. Its elevation is about 500 or 600 feet, and it is some hundreds of miles inland. A very intelligent lady missionary, a native of Middle Georgia, returned from China, gives some particulars concerning the climate of Suchow. The temperature of a summer day is usually from 80 to 93 degrees; of a summer night, 60 to 70; that of a winter day 40 to 60; a winter night, 36 to 45. Changes are violent and sudden. The South-west monsoon tempers the heat, but induces a strange debility. Exposure to the sun is injurious and sickening. The east winds in winter are penetrating and cold. Snow falls often, but does not remain long. In May occurs the "yellow mould" season, when everything becomes excessively damp and sticky.

COMPARISON WITH A TROPICAL CLIMATE.

Bombay lies in latitude 18.57 north. The mean temperature is 80 degrees; maximum 100, minimum 70. The mean rainfall is 80 inches; maximum 100, minimum 51 inches. Nearly all the rain falls in four months, June, July, August and September, the rainy season; about 2 inches in October, not 1 inch in all the other 7 months. The following table* compares its monthly mean temperature and rainfall with that of Georgia:

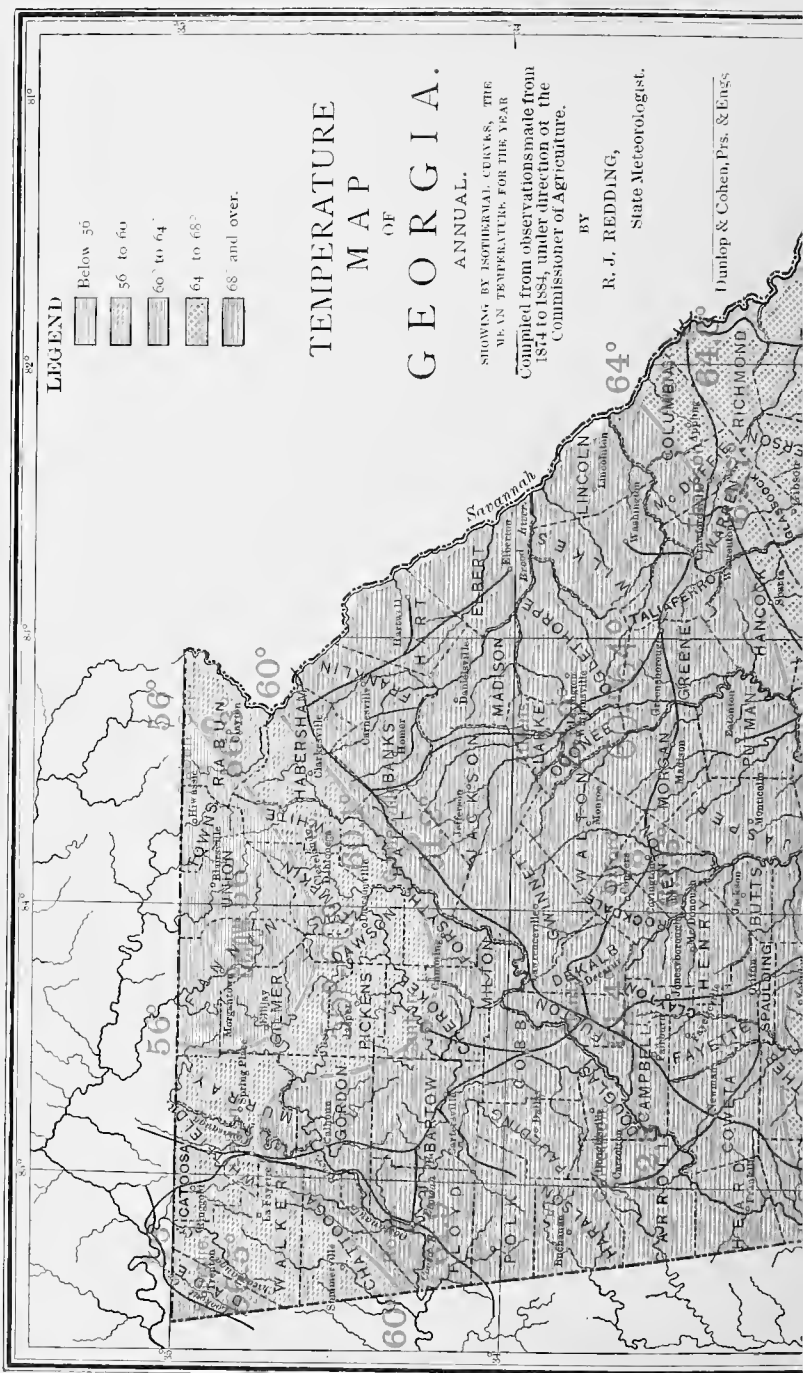
	Mean Temperature.		Rainfall.	
	Bombay.	Georgia.	Bombay.	Georgia.
January	75.38	48.4	0.03	4.63
February	75.86	52.7	0.01	3.57
March	79.16	57.4	0.01	4.91
April	84.38	64.5	0.02	4.75
May	86.72	72.4	0.41	2.72
June	79.16	77.9	22.02	4.00
July	77.36	81.8	22.69	4.13
August	77.36	79.3	13.10	5.31
September	80.78	75.0	9.47	4.45
October	81.14	67.5	2.01	3.37
November	79.16	55.4	0.27	3.20
December	75.86	49.0	0.09	4.23
Annul.	79.36		67.38	49.28

*From the Popular Science Monthly, February, 1885.






Note the compensation caused by the rainy season. In May the mean being 86.72, it drops in June to 7.916, not much above the June temperature of Georgia, and in July and August *below* our mean. As the rains slacken in September, the thermometer rises again above 80 degrees, but all the hot months are tempered. The rainfall of the year, quoted, was below the average. Still the rainfall in June was nearly as great as our whole spring and summer rainfall—the fall of six months. In three months, June, July and August, rainfall was 57.81, largely exceeding ours for twelve months.

GREAT BRITAIN.

The Gulf stream so tempers the winter climate of Great Britain that the winter isotherm of North Georgia, latitude 34, is but a



LEGEND

-  Below 56
-  56 to 60
-  60 to 64
-  64 to 68°
-  68° and over.

TEMPERATURE MAP OF GEORGIA. ANNUAL.

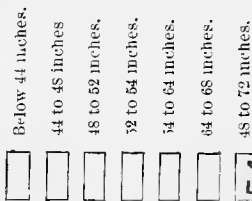
SHOWING, BY ISOTHERMAL CURVES, THE
MEAN TEMPERATURE FOR THIS YEAR
Compiled from observations made from
1874 to 1884, under direction of the
Commissioner of Agriculture.

BY
R. J. REDDING,
State Meteorologist.

Dunlop & Cohen, Prs. & Engrs.



LEGEND



Over 72 inches.

RAIN MAP

OF

GEORGIA.

ANNUAL.

SHOWING BY ISOTHERMAL CURVES
THE MEAN PRECIPITATION OF
RAIN AND MELTED SNOW
FOR THE YEAR.

Compiled from observations made
from 1874 to 1884, under direc-
tion of the Commissioner
of Agriculture, by

J. R. REDDING,
State Meteorologist.

Dunlap & Collier, Pres. Engs





WEATHER PROVERBS

are very common, but usually of merely local adaptation. One set of proverbs was brought from England to New England and Virginia, then were brought to Georgia, and carried from Georgia, west, but they are not correct for the altered local conditions. They are the wisdom of a different region. So limited with us is their range that we have wet and dry streaks in the same county and neighborhood.

The Scripture proverbs really suit us, the signs of the weather times, better than the English. Every slope differs. The proverbs of the Atlantic and Gulf slopes vary. In Texas, a new comer is green in many ways, but in none more so than as regards the weather. His predictions and expectations excite laughter.

Our winter and summer signs differ. The northwest is our clearing point in winter, and usually it clears off cold, yet a warm rain is often followed by cold, and a cold rain by warm weather. A clearing in the night lasts a short time only—at noon or sundown, it is more permanent. When at the first of a season it clears off cold, it is apt to continue to clear off cold; so when it starts with a warm clearing, that is apt to continue. In the summer, after a drouth, northeast winds and cloudy weather often last a long time without rain. There seems to be a diurnal struggle between sun and rain, and the sun is victor. In summer, if the wind rises too soon, before two o'clock, the sun will get the better of it and there will be no rain. A south wind for twelve hours usually brings rain. Northeast winds in the winter were formerly a more sure sign of rain than now. There is a proverb generally true—three white frosts and then a rain. A dry or wet streak usually lasts for some time; fail of the first rain, and fail of several or all.

The freedmen have some quaint proverbs: One is to the effect that a bright first day of February will not last. "When the bear and the ground-hog come out on the first day of February and see their own shadows, they get scared and hide again for forty days." Another freedman's proverb, "If the sun rises clear, but puts on his night cap again before breakfast, it will rain before dinner."

The best sign for rain is sheet lightning in the north. We un-

derstand that in parts of Kentucky it is sheet lightning in the south. Distant lightning is the surer sort, when no cloud is visible. We might multiply proverbs, but the object of the chapter, protracted as it is, is rather to serve as a start and *nucleus*, around which to gather the information now scattered in the State. Weather notes are to be found in diaries, or in the memories of old men, which would be of value if collected.

SUITABLENESS OF THE CLIMATE TO MAN.

The climate suits all the races. It has been tested by three: the red man, the white and the black. There is no reason why it should not suit the yellow man also, being in the same latitude with China. The Cherokees and the Creeks were fine specimens of their race, above the average aboriginal Americans in development, physical and mental, and perhaps also moral. The blacks certainly multiply and thrive and improve here, in numbers, intelligence and character. Of the whites we need not speak; they have been well represented in the history of the country, in earlier and later times alike. The South has supplied her full quota of presidents, and of the leading and guiding intellects of the country. Two of the great trio of a half century ago were her sons. Nor has our own State been behind others in influence in the national councils, or in the management of her own affairs.

Perhaps, indeed, albeit somewhat proud of our land, we do not fully appreciate its great natural advantages. It is of the very latitude and clime associated most closely with primitive man, with the birth-place of the race. The country is of the same character with the Holy Land, Syria, Persia, and further east with the original habitat of the Aryan race. This greatest of primitive stocks had in this latitude its cradle, and became the mother of the three greatest peoples of history, the Greeks, Romans and Teutons.

In this climate are the ancient cities of Jerusalem and Damascus, Babylon and Nineveh, Alexandria and Carthage. These are the parallels of the earliest monuments and earliest associations, the birth-place of history, of the highest civilization and the development of man. It is the region of which Professor Draper says in his *History of the Civil War in America*: "No climate or

zone on the face of the earth has produced greater men, or more profoundly affected the course of human affairs. If there be a geographical band of which the inhabitants have completely delivered down their annals to succeeding generations, a band that deserves the title of the Historical, this is it."

Indeed, the kindness of nature has only stopped short of prodigality. Our favored clime closely resembles that described in Holy Writ, of which Moses gave so tempting a description to the hesitating Israelites: "A good land; a land of brooks of water, of fountains, and depths that spring out of valleys and hills; a land of wheat, and barley, and vines, and fig trees, and pomegranates; a land of oil, olive, and honey; a land of corn, and wine, and oil, which drinketh water of the rain of heaven; a land which God careth for, and sendeth the rain in his season; a land wherein thou shalt eat bread without scarceness; a land whose stones are iron, and out of whose hills thou mayest dig brass."

The picture intended for the same latitude is almost a literal one. It is difficult to over-state the natural advantages which fit Georgia for thousands more of abundant and happy homes.

It is but natural that we should speak well of it, though we do not fully appreciate it, but strangers also speak of it with high admiration. Officers of the Northern army were charmed with it. Pike, in his book on South Carolina, declared it "an agricultural Paradise." General Dodge, in "Farm and Factory," says: "It is a healthy and beautiful land, redolent of flowers and surfeited with wild fruits, while cultivated fruits of the temperate and sub-tropical zones grow profusely, with little care or cultivation. The dweller in a forest cabin can subsist in luxury on fish and flesh and fruits, with venison, turkey or duck upon his table daily. The climate is so mild that his house could be constructed with a few days' labor in the primitive forest. Life is rich and full and joyous in this sunny land."

It were tedious to quote the multiplied expressions of the same character. It is like the land spoken of in the book of Judges: "A place where there is no want of anything that is on the earth," or elsewhere, "the eyes of the Lord are always upon it, from the

beginning of the year even unto the end of the year." For this is a land of the same sort spoken of in the Scriptures.

Our partial failure to enjoy it and glory in it is due to that spirit so well described by George Eliot as moral stupidity, which cannot see beauty or heroism in its own age and clime and people.

Why do we not, however, make it more prosperous and desirable? Why do we have hard times and poverty?

We fear we must plead guilty, in part, at least, to the offense charged upon us by an English traveler through the South. He was shown a very fine pear of exquisite flavor (a Georgia pear took the prize above all the world some years ago at a large pomological exhibition in Boston), and was told, "We can raise such pears without any trouble." "Yes," was his reply, "I do not doubt that, for, from what I have seen here, if they cost you any trouble, you would not have them." Seeing some fine specimens of oats, he was informed they were simply sown just before the last sweeping of cotton "Oh, yes, that's your way, scratch them in, scratch them in."

We do not acknowledge this indictment in full, but there is a grain of truth in it.

The writer has often thought in the summer and fall of the Bible picture of peace, where each man could sit under his own vine and fig tree, as he sat under a scuppernong, covering a large square in a garden, spreading over a surface as large as a wide spreading oak, and fragrant with bushels of delicious grapes, and passed in a few paces to what a Virginia gentleman called a "fig orchard," doubtful whether the Italian or the Celestial were the most luscious.

The scuppernong makes a most delicious wine. The figs might be an article of commerce if dried; yet we do not take the trouble needful, but either do without the wine or import it, and buy the figs brought across the ocean, and the pears from California.

We do not all do this. Some take the trouble and reap the good fruits. In Middle Georgia, in the fall of 1871, a fair was held and a premium offered for the greatest variety of vegetables. One exhibitor displayed 24 vegetables. It was on the 10th of November. Searching closely, we afterwards found three varieties not represented. The exhibitor was General Toombs. He says of this

region, that after traveling much in this country and abroad, he has seen no climate better fitted for man and beast and fowl for health and comfort, abundance and variety, than Middle Georgia, the heart of the State.

Of the South, indeed, as a whole, it has been well said, that wide as is the Empire of England on every continent and many of the isles of the ocean, the sun never setting on her flag, the climate of the South is, on the whole, the finest climate in which the English language is spoken.

STATIONS.

	JAN.	FEB.	MCH.	APR.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.															
Above Sea Level.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.	Mean Temp.															
	Rainfall.	Rainfall.	Rainfall.	Rainfall.	Rainfall.	Rainfall.	Rainfall.	Rainfall.	Rainfall.	Rainfall.	Rainfall.	Rainfall.															
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.															
NORTH GEORGIA.																											
1 Ell's Isle.	2.40	38.4	6.61	41.65	17.4	46.74	57.06	14.65	8.4	40.70	8.2	59.71	67.7	1.04	57.6	5.52	46.3	13.17	37.27	38							
2 Gameville.	1.224	43.3	7.11	48.6	74.34	56.52	61.2	4.65	63.0	2.22	75.0	4.3	78.6	3.17	61.3	2.7	49.4	3.64	41.2	35.22							
3 Leo (White Co.)	1.588	41.8	6.97	46.1	6.43	17.48	59.1	5.34	66.3	2.73	74.2	1.71	62.2	4.22	49.0	4.33	43.6	4.6	42.6	6.02							
4 Rab in Gap.	2.108	39.5	7.09	43.7	4.06	46.2	7.86	56.2	6.75	63.9	4.41	70.2	5.6	46.5	6.96	46.5	4.99	4.0	4.60	4.60							
5 Rome.	42.85	75	47.7	4.65	68.5	5.54	61.9	5.92	70.2	2.51	75.7	2.79	80.3	2.51	78.4	4.88	72.6	2.36	65.0	3.21	51.1	3.70	43.8	4.28			
Average.	41.2	6.71	15.4	45.95	30.5	6.83	50.1	5.38	66.9	3.26	73.2	3.95	77.2	3.80	75.4	5.82	63.6	1.25	61.7	4.53	48.5	3.96	41.8	5.80			
MIDDLE GEORGIA.																											
6 Athens.	44.9	8.24	19.35	68	53.1	16.46	62.1	1.84	72.6	3.22	77.6	1.00	82.0	0.3	71.9	3.4	63	71.0	3.0	67.3	2.31	50.1	4.19	43.4	4.29		
7 Atlanta.	43.1	16.03	48.8	4.61	53.4	4.05	63.4	2.57	75.2	4.38	73.7	2.84	77.3	3.57	72.0	2.61	63.4	2.61	49.7	1.01	43.8	8.10	41.4	4.46			
8 Carrollton.	43.1	15.78	48.3	5.13	54.0	6.84	62.2	2.57	71.6	69.6	4.2	75.8	3.15	80.4	1.27	73.3	2.71	61.9	3.25	51.1	1.3	85.4	41.4	4.46			
9 LaGrange.	778	45.6	4.07	51.4	64.55	2.6	90.63	1.4	53.2	72.4	4.52	64.4	2.99	82.3	3.27	79.1	15.20	73.3	1.83	67.4	3.22	53.5	2.85	46.7	6.06		
10 Macon.	332	50.5	3.83	52.8	2.96	59.1	15.89	64.8	4.39	73.4	2.87	78.9	2.83	83.0	3.53	4	6	36.75	8.21	69.0	2.10	55.5	2.95	50.5	4.45		
11 Oxford.	770	43.9	4.48	49.3	4.25	54.3	6.42	62.1	1.5	42.7	70.7	2.43	77.8	3.71	82.2	3.63	78.4	1.6	31	72.9	3.15	65.6	2.73	52.3	3.50	43.0	4.38
12 Thomson.	531	46.9	4.30	52.6	3.14	56.7	5.58	64.0	4.27	72.2	2.43	77.8	3.71	82.2	3.63	78.4	1.6	31	72.9	3.15	65.6	2.73	52.3	3.50	43.0	4.38	
Average.	45.4	5.18	50.4	4.34	55.1	6.29	62.8	4.83	71.2	2.59	77.3	3.55	81.6	3.54	78.6	5.17	73.6	2.71	66.4	2.68	52.4	3.70	45.9	4.94	4.97		
SOUTHWEST GEORGIA.																											
13 Americus.	369	51.6	3.11	56.2	3.7	61.1	5.63	68.4	4.54	75.4	2.87	80.1	4.47	83.2	5.80	65.6	69.76	9.3	46.70	8.27	60.0	7.22	70.5	53.8	3.40		
14 Cuthbert.	446	51.4	3.61	56.7	1.68	59.3	3.97	68.3	3.38	73.6	2.80	81.1	3.80	83.4	3.33	80.4	74.77	9.4	95.71	2.1	32	59.6	4.17	53.8	3.4	78	
15 Nashville.	52.0	4.29	56.7	2.76	62.9	3.87	67.5	3.20	74.7	2.46	78.7	5.01	81.8	3.42	80.1	16.18	77.8	1.18	70.2	3.30	58.4	2.49	53.5	53.01			
Average.	51.7	4.34	56.6	2.50	61.3	4.43	68.1	3.37	74.6	2.71	80.0	4.43	82.9	4.52	80.1	15.54	77.5	4.20	70.2	2.40	59.6	6.12	53.5	3.74			
EAST GEORGIA.																											
16 Augusta.	156	46.9	4.01	52.1	2.47	55.2	4.80	62.1	4.02	71.4	2.78	77.1	3.58	81.9	3.73	80.4	4.42	71.0	4.1	65.9	9.22	53.8	3.37	47.7	3.44		
17 Ogeechee.	1	54.3	1.65	54.8	2.70	59.4	3.93	65.6	4.05	75.7	2.22	80.4	2.87	83.5	3.92	80.3	6.97	77.6	4.49	66.1	1.80	55.0	3.9	4.92			
18 Swainsboro.	47.4	2.83	53.4	2.68	59.3	3.39	66.5	3.80	76.0	1.81	81.1	3.85	85.4	2.99	82.0	4.62	77.1	3.33	69.4	2.79	56.0	3.24	59.5	4.03			
Average.	49.5	2.83	53.4	2.62	58.0	4.04	64.7	3.96	74.4	2.27	79.5	3.43	83.6	3.55	81.0	5.31	76.2	4.08	67.3	2.20	54.9	3.30	51.1	3.73			
SOUTHWEST GEORGIA.																											
19 Blackshear.	127	55.7	6.2	35.5	3.18	62.4	3.53	68.7	4.84	75.1	3.28	80.0	2.19	84.2	4.86	82.5	4.02	80.2	8.88	71.2	5.52	65.0	1.81	55.3	3.22	72	
20 Brunswick.	16	54.1	3.12	37.4	2.16	61.9	2.88	67.8	1.25	73.4	2.76	80.2	6.62	83.3	3.5	81.1	4.77	72.5	61	70.9	63.00	8.2	64.5	6.2	86		
21 Wadsworth.	52.6	2.96	55.9	2.01	61.6	2.47	67.1	3.48	74.3	2.57	79.1	4.26	82.9	5.42	79.1	5.30	76.7	6.39	68.9	3.94	58.7	2.29	53.8	3.13			
Average.	54.1	4.11	57.9	2.45	62.0	2.96	67.9	1.19	75.0	2.87	79.8	4.36	83.5	5.22	80.9	4.66	75.0	7.03	71.3	5.03	61.2	2.05	54.7	2.20			
Average for the State.	48.4	1.63	52.7	3.57	57.4	4.91	64.5	4.73	72.1	2.72	77.9	4.00	81.8	4.13	79.3	5.31	71.0	4.45	67.5	3.37	55.3	4.30	49.0	4.22			

DEPARTMENT OF AGRICULTURE.

STATIONS.	MEAN TEMPERATURE					TOTAL RAINFALL.					SERIES FROM AND TO	
	SEASONS.					Spring.	Inches. Summer.	Inches. Autumn.	Inches. Winter.	Inches. Annual.		
	Spring.	Summer.	Autumn.	Winter.	Annual.							
NORTH GEORGIA.												
Ellerslie.....	56.7	73.1	57.2	39.1	56.5	17.23	13.88	13.33	19.74	64.23	May '17 to May '83	
Gainesville.....	61.2	76.7	61.5	45.4	61.2	13.39	13.64	9.87	18.07	54.97	April '84 to July '84	
Leo (White county).....	59.2	76.7	60.6	43.8	60.1	15.55	14.77	13.26	19.42	68.00	April '78 to July '84	
Rabun Gap.....	55.1	71.7	57.5	41.0	56.3	14.02	15.44	18.01	20.24	71.71	Jan. '78 to July '84	
Rome.....	61.9	78.0	62.9	44.8	61.9	13.10	10.18	9.27	14.68	47.23	April '78 to July '84	
Average.....	58.8	75.3	59.9	42.8	59.2	15.47	13.57	12.74	18.44	60.22		
MIDDLE GEORGIA.												
Athens.....	62.6	79.7	63.8	45.9	63.0	14.52	12.94	9.60	18.21	55.27	April '78 to July '84	
Atlanta.....	61.4	77.5	61.7	45.2	61.4	13.16	10.80	9.29	15.74	48.99	Feb'y '76 to July '84	
Carrollton.....	61.9	78.2	62.6	45.3	62.0	15.09	12.54	9.81	15.86	53.30	April '78 to July '84	
LaGrange.....	63.6	80.2	64.7	47.9	64.1	13.50	12.76	7.88	14.79	48.93	April '78 to July '84	
Macon.....	65.8	80.7	66.8	51.3	66.1	13.12	12.72	7.18	11.74	44.76	April '78 to June '82	
Oxford.....	62.4	78.5	63.6	46.1	62.6	14.33	14.02	9.38	13.71	51.44	April '78 to July '84	
Thomson.....	64.3	79.5	65.9	49.1	64.7	12.28	12.16	9.74	11.36	45.54	April '78 to July '84	
Average.....	63.0	79.2	64.1	47.2	63.5	13.71	12.56	8.98	14.49	49.74		
SOUTHWEST GEORGIA.												
Americus.....	68.3	81.3	69.5	53.9	68.2	13.04	15.96	8.53	9.58	47.11	April '78 to July '84	
Cuthbert.....	67.3	81.7	69.6	53.9	68.1	13.15	12.87	10.44	12.07	48.53	Mar. '79 to Oct. '83	
Nashville.....	68.4	80.3	68.8	54.1	67.9	11.36	14.61	10.17	10.09	46.23	April '78 to June '84	
Average.....	68.0	81.1	69.3	54.0	68.1	12.52	14.49	9.72	10.58	47.30		
EAST GEORGIA.												
Augusta.....	62.9	79.8	64.6	48.9	64.0	11.60	11.73	9.80	9.92	43.05	April '78 to July '81	
Ogeechee.....	66.9	81.5	66.1	54.7	67.3	16.20	13.76	9.58	8.08	41.62	April '78 to Sept. '81	
Swainsboro.....	67.3	82.8	67.5	56.4	67.0	9.06	11.46	9.36	9.53	39.35	May '78 to Feb'y '81	
Average.....	65.7	81.4	66.1	51.3	66.1	10.27	12.32	9.58	9.18	41.35		
SOUTHEAST GEORGIA.												
Buckshear.....	68.8	82.2	73.1	57.2	70.3	11.65	11.07	16.21	12.15	51.08	April '78 to Dec. '81	
Brunswick.....	68.4	81.5	69.6	55.5	68.7	9.89	16.57	13.28	8.14	47.88	April '78 to July '84	
Walthourville.....	67.7	80.4	68.1	54.1	67.6	8.52	15.07	12.82	8.10	44.51	April '78 to July '84	
Average.....	63.3	81.4	70.3	55.6	68.9	10.02	14.24	14.11	9.46	47.83		
Average for the State	64.8	79.7	66.0	50.1	65.1	12.38	13.44	11.02	12.43	49.28		

CHAPTER V.

GEOLOGY.

This manual being chiefly intended for popular use, it becomes necessary to present some preliminary general ideas in relation to geology.

In the transitions which the earth has undergone, through a long series of changes, by which it was gradually reduced to the condition in which we find it, long periods have elapsed, in the course of which the earth has passed through conditions fitting it, first, for the lower forms of vegetable and animal life in the water, and then for the higher forms of vegetable life, and for the lower land animals, and so on successively, culminating in man—a being endowed with the highest intellectual capacity. Each phase included much of the old with new features superadded, and each new feature surpassing the old in perfection of organism.

The first appearance of dry land is supposed to have been in a V-shaped mass, in upper North America, which is therefore believed to be the oldest of continents, although possibly among the last to be peopled. The outline of the first emerged lands prefigured the present form of the continent. This formation, to which the name of Eozoic [dawn of life] has been given, covers a large part of Canada and the British possessions, extending into the United States in two large arms, parallel with the Pacific and Atlantic oceans. One of these, the most extensive, along the Rocky Mountain range; the other following the Apalachian chain of mountains, and crossing the State of Georgia, terminates in Alabama, where it is overlapped and covered non-conformably by newer formations.

In the next great period a large part of North America emerged, including Northwest Georgia. This was followed in the order of succession by the cretaceous and tertiary of the South Atlantic and the Gulf coast region, including the most recent formations.

The geological formations have been named on more than one principle of classification. The system generally adopted is by the relation of the strata to the life of the age as shown by the fossils contained within the rocks. The larger subdivisions in accordance with this system are:

I. Archæan, Including an Azoic age—*without life*—and an Eozoic age—*the dawn of life*.

II. Silurian Age, or Age of Invertebrates.

III. Devonian Age, or Age of Fishes.

IV. Carboniferous Age, or Age of Coal Plants.

V. Mesozoic Age, or Age of Reptiles.

VI. Tertiary Age, or Age of Mammals.

VII. Quaternary Age, or Age of Man.

Each of the Ages are subdivided into Periods, and the Periods into Epochs. These subdivisions are based either on minor variations in the fossil remains, or else on the differences in the constitution of the rocks, and vary in different countries. A formation in separate localities may vary in the composition of its rocks, as do the ocean sediments of to-day.

A lithologic classification, or one based on the characteristics of the rocks of which the formations are made up, as it relates to their composition and consistency, is a better system for practical purposes, and particularly so in its relation to agriculture as indicating the kind of soil derived therefrom.

That a formation has been of simultaneous deposition in every region of its occurrence is not now generally believed. The theory that the earth has passed from some highly heated condition to its present state carries with it the conclusion that life most probably commenced in the polar region, as there the necessary reduction of temperature would first be reached, and that it progressed from these centers towards the Equator as the conditions became more favorable for its existence. While Silurian deposits were forming in some parts of the old ocean bed, the Devonian may have been in progress somewhere behind it where the environments were fitted for a higher type of life, and in this way the succession of life would be the same for all parts of the earth, while deposits differing far in character of life may have been of synchronous ori-

gin. The missing links observed in the order of life in many localities may be accounted for by the unfitness of the condition to sustain the new order of life, leaving such areas through an epoch in possession of the older colonies.

GEOLOGY OF GEORGIA.

The Geology of Georgia is a part of that which characterizes both the Atlantic slope and the Mississippi basin, including all the principal geological formations of the Apalachian and Atlantic coast region. All the larger divisions in geology are represented in the State. These beginning with the oldest are:

I. The ARCHÆAN in the *Metamorphic* of Middle and Northern Georgia.

II. The PALEOZOIC, in the *Silurian*, *Devonian* and *Carboniferous* of Northwest Georgia.

III. The MESOZOIC in the *Cretaceous*, lying south and east of Columbus.

IV. CENOZOIC, in the *Tertiary* and Quarternary of Southern Georgia.

The eastern line of the State crosses the Archæan at its greatest expansion. The State also extends into the Paleozoic on the northwest and the Tertiary on the south, at the points of their greatest expansion.

ARCHÆAN OR METAMORPHIC.

The Metamorphic covers the larger part of the agricultural divisions of Middle and North Georgia. The southern limit of its exposure may be very correctly defined by a line drawn on the map of the State from Augusta, through Milledgeville and Macon, to Columbus. This line will be found to cross each navigable stream at the head of navigation where the rocks, dipping nearly vertically, are covered by Cretaceous and Tertiary strata. North of this, with the exception of the ten counties of Northwest Georgia, the formation covers all the country and extends beyond the limits of the State.

When the Metamorphic is approached from either of the newer formations, a decided change is observed, not only in the character of the rocks, but in the general appearance of the country, and to

some extent in the indigenous growths. Approached from South Georgia, the change is from a rolling region of sandy lands to one of a more broken character, with a rocky or gravelly surface;—from pine lands to lands covered with a growth of oak and hickory, and from a sandy region where surface rocks, if any, are of a rounded or water-worn character, and of small sizes, to a rocky or gravelly surface with angular pebbles or rock fragments of various sizes and with the common occurrence of larger rock masses.

In approaching the metamorphic from Northwest Georgia, there is a change from a region of parallel valleys and ridges, that are usually continuous for long distances, to a generally broken country where such distinctions are not so well defined;—from a limestone to a freestone country, and from one where the rocks are sandstones, limestones and shales or slates, often abounding with impressions of shells, crenoids, corals, seaweeds, or other organic remains, to one in which the rocks are of crystalline structure, with no evident traces of organic life.

The Topography of the metamorphic area of the State is that of a broken region. The country gradually rises toward the North, and is generally hilly, with few elevations rising to the proportion of mountains in Middle Georgia, but becoming quite mountainous in some parts of North Georgia. The country rises to the very general level of two thousand feet above sea near the northern line of the State, with mountains of from three to five thousand feet.

The formation terminates in Northwest Georgia in a bold and rugged escarpment, facing toward the west or northwest, in what are known as the Cohutta, Salicoa, Pine Log, Allatoona, and Dug Down Mountains, constituting the Cohutta range. This range is two thousand feet above the valleys of Northwest Georgia in the Cohutta Mountains, but becomes gradually lower toward the southwest, until in the Dug Down Mountains it is only five or six hundred feet above the valleys, and the summit corresponds nearly with the general level of the country to the southwest.

This feature of the range is shown by the Hyprometric map, following page 16.

The Archæan has been subdivided into two principal groups, the *Laurentian* and the *Huronian*. The formation has not been studied with sufficient care in Georgia to indicate these subdivisions. The rocks south of the Chattahoochee Ridge, as well as some

portions of the country north of this ridge, correspond generally with the lithological character of the Laurentian group, and an extent of country west of the Blue Ridge with that of Huronian.

In the following extracts from Dana's Manual, are given the rocks and minerals that are regarded as characteristic of the Lourention group, the most, or all of which, are common to this portion of the metamorphic region in Georgia.

"Kinds of Rocks.—The rocks, with few exceptions, are metamorphic or crystalline rocks. They include granite, gneiss, and some mica schists; also, very prominently, rocks of the hornblende (and pyroxene) series, as syenite, hornblendic gneiss, and other kinds; also extensive beds of crystalline limestone. Besides these there are quartzite and conglomerate. The lime-and-soda feldspar—called labradorite—often characterized by a beautiful play of colors, is common in Archæan terranes forming with a lamellar mineral related to pyroxine or hornblende, the rock hypersthénite. Chrysolite, a silicate of magnesia and iron, is a constituent of some hypersthénite, and also forms, with labradorite, a rock called assipite, occurring in the White Mountain region.

"Abundance of iron bearing minerals is a striking characteristic of the Archæan rocks. It is the cause of the frequent reddish color of the feldspar of the granitic rocks. It is apparent in the prevalence of rocks of the hornblende series, the black variety of hornblende and pyroxine present in them containing much iron. It is especially manifested in the existence of immense beds of iron ore, which consists either of magnetite, or of hematite, or of tetanic iron (the last differing from the others in having a part of the iron replaced by titanium.)

"Another very common mineral, is graphite (or plumbago), a form of carbon. It occurs disseminated through the rocks, especially the limestones, constituting 20 to 30 per cent. of some layers, (which therefore are worked for the graphite.) It is often met with in scales through the iron ores; also in veins which afford it in a purer state, and often crystallized.

"There are in addition diorite, epedote gneiss and schist; massive hornblende rock and hornblende schists; garnet-euphotide and feldspar-euphotide, soapstone (rensselaerite), serpentine, ophiolites or verde antique marble of different varieties."

HURONIAN.—The Cohutta range of mountains contains a series of rocks agreeing well with the lithological character of the Huronian. There are black and greenish colored slates, conglomerates, quartzites, chlritic slates, epidotic gneiss and porphyritic rocks. Though there exists in Georgia large areas with rocks corresponding in character with the Huronian and others, as has been said with the Lurentia. No well defined line can be traced on the map between these lithological groups as the areas have been but imperfectly determined.

Some geologists regard the Metamorphic formation of the slate as changed Silurian rocks. This view of their age was held by Professor F. H. Bradley, who devoted much time to the study of the series in Tennessee, North Carolina and Georgia.

In the second Report of Progress of the Geological Survey, Dr. Little says: "The relation of the metamorphic rocks in these (the Cohutta) mountains, as well as that in the Blue Ridge and across the Chattahoochee Ridge along the Tugalo and Savannah rivers, to the corresponding adjacent parts of Tennessee, North Carolina and South Carolina have been studied, and a regular succession of Potsdam, Quebec and Cincinnati rocks found in alternating bands, while the whole of this metamorphic region appears to be of Silurian age. Professor Bradley reports: 'The extension of the gold-belt over large areas not previously recognized as gold-bearing the determination of the age, equivalency and position of nearly every important stratum in the Blue Ridge of Georgia, including the copper ores of Fannin and Gilmer, as well as those of Lumpkin and Towns and the corundum belts of Union, Towns and Rabun (with the probable position of the equivalents of these latter in Habersham, White, Lumpkin and Dawson,) and the determination of numerous levels which affect both the working of large areas of the gold-field and the location of projected railroads.

"The points of greatest scientific interest are the identification of the serpentines, chrysolites, chlorites and stellites of the corundum belts, with the magnesian limestones of the Quebec group (Th. Knox Dolomite of Safford,) and that of the underlying schists of the gold-belt with the Knox shale of the lower part of the Quebec.'"

The series has been but imperfectly studied; even the relative

*Second Report of Progress of the Mineralogical, Geological and Physical Survey of the State of Georgia for 1875, page 13.

positions of some of the groups are in dispute and the question of age or possible equivalency remains in abeyance waiting further research and will not be further considered here.

Metamorphic Rocks.—The chief rocks are granite gneiss, mica-schists and magnesian rocks. Such varieties of these as are common in Georgia will be briefly described.

Granites are of common occurrence south of the Chattahoochee ridge, but are rarely found in large masses north of this. There are four varieties in Middle Georgia: 1. A gray granite, composed of quartz, feldspar, and a dark colored mica; 2, a flesh colored granite, similar in composition to the last with a pink feldspar; 3, a syenite, or dark colored granite composed largely of hornblende; and 4, a variety, known as granulite, made up of quartz and feldspar, common in some parts of Middle Georgia.

Gneiss.—Gneiss is similar in composition to granite, only much more variable in character as it occurs in this State. The materials, unlike granite, are generally distributed irregularly in layers, often giving to the stone a beautiful banded appearance. Some varieties, however, are uniform in the distribution of the constituent minerals and can be distinguished from the granites only by its existing in beds like other stratified rocks. Such varieties are often called gneisoid granites. *Hornblende Gneiss*, composed of quartz, hornblende and feldspar, is a common variety, sometimes covering large areas and giving rise to a deep red soil where this is the prevailing rock. It often occurs in thin layers along with other varieties of gneiss and not in sufficient quantity to affect materially the character of soil. It varies from a dark gray to black, according to the percentage of the black mineral hornblende that enters into the composition of the rock, and from which it derives its name. *A garnetiferous gneiss* is found along the Chattahoochee ridge, and a bed of this character has been passed through in the boring for artesian water in Atlanta. An epidotic gneiss is found west of the Blue Ridge and in Troup county.

Mica Schist.—This rock has the same composition as gneiss, but contain much more mica. It covers some extensive belts of country. The lands are usually of a sandy nature and the soil is filled with glistening particles of mica and often covered with quartz fragments.

Itacolumite.—The itacolumite, or flexible sandstone, outcrops along

the Chattahoochee ridge, from Habersham probably to Troup county. It is found again near the eastern base of the Blue Ridge, and about the western sides of Gilmer, Pickens and Cherokee counties, and also further south in Harris, Meriwether and Pike counties in the Pine Mountain range. The nauvaculite, of Graves Mountain in Lincoln, is believed to belong to the itacolumite series. This sandstone dips southeasterly, as do most of the rocks of the country, where it has been observed, and underlying it on the northwest is a graphitic hydramica schist, and below this again a crystalline limestone or marble. The series is an interesting one from its supposed relation to the diamonds that have been found in this State, as well as in North and South Carolina.

Magnesian Rocks.—A chloritic schist exists in heavy beds near the northern limit of the metamorphic region, and is distributed in less quantity elsewhere over the country to the south. Soapstone or talc is found in many localities.

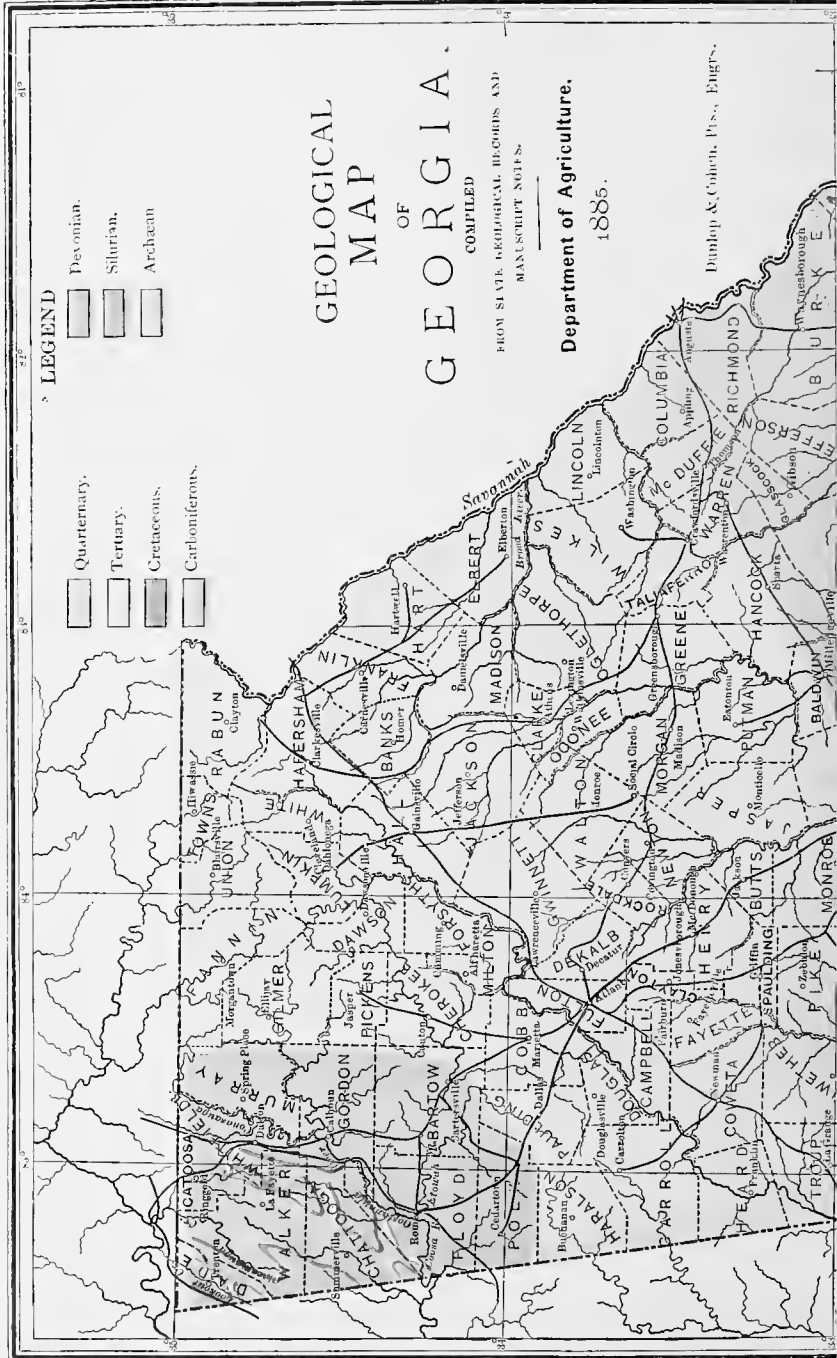
The metamorphic rocks commonly contain quartz veins, and are sometimes crossed by trap dikes. The quartz veins usually conform to the laminae or to the bedding of the rocks, while the traps cut these almost at right angles, and traverse the country in a direction little west of north.

Between the Cohutta and Blue Ridge Mountains and nearly everywhere south of the last named mountain, and particularly in Middle Georgia, the rocks are very generally decomposed down to the constant water-level of the country or to the depth at which lasting water is obtained in wells.

Among the more common minerals belonging to the formation in Georgia may be named quartz mica, feldspar, hornblende, garnet, Tourmaline, graphite, epidote talc, rutile, hematite, magnetite, titanite iron, with many others less generally distributed.

PALEOGEOIC FORMATIONS.

These are ten counties of the State in what is known as the limestone region of Northwest Georgia. This section in Georgia is limited by a metamorphic range of mountains, extending around it in a semi-circle on the east and south. This range runs near the eastern sides of the counties of Murray and Gordon, and the eastern and southern sides of Bartow and Polk. The larger part of each of these are covered with silurian strata. The counties lying wholly



LEGEND

- | | | | |
|-----------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------|-----------|
|  | Quaternary. |  | Devonian. |
|  | Tertiary. |  | Silurian. |
|  | Cretaceous. |  | Archaean. |
|  | Carboniferous. | | |

GEOLOGICAL MAP OF GEORGIA.

COMPILED
FROM STATE GEOLOGICAL RECORDS AND
MANUSCRIPT NOTES.

Department of Agriculture.
1885.

Dunlap & Cohen, Print., Eng'rs.



within the paleozoic are Dade, Walker, Catoosa, Chattooga, Whitfield and Floyd. The following description of some of the surface features of the section was prepared from notes of the geological survey of the State for Prof. Hilgard's report on cotton production:

Topography. —“The country is banded by a number of mountains, ridges, and valleys, extending with a general parallelism in an approximate northeast and southwest direction, approaching nearest to north and south in the eastern part of the division, and with divergent mountains running nearer to east and west in the southern and central portions. Sand, Lookout and Pigeon mountains, in the northwestern corner of the State, are synclinal table-lands belonging to the Alleghany coal-field. These vary in altitude from 800 to 1,200 feet above the adjacent valleys, and are usually trough-shaped on the top, having somewhat elevated borders along their brows and precipitous sides, marked by perpendicular sandstone bluffs. These mountains have an area on the top of rolling and often nearly level sandy lands amounting in the aggregate to 200 square miles. Lookout mountain is separated from Sand mountain on the northwest by Lookout valley, which has a width of 3 or 4 miles, and extends from Alabama across this part of the State into Tennessee. Pigeon mountain is an easterly spur of Lookout mountain, giving rise to a V-shaped valley, which widens out toward the north, and is known as McLemore's cove. These mountains are bordered throughout most of their extent by steep sandstone ridges of from 100 to 300 feet in height, giving rise to narrow valleys around their bases. These ridges are a constant feature of the table-land mountains, and occur everywhere in this relation to them, except where they have disappeared by erosion. About the central portion of Pigeon mountain, where the table-land feature is lost with the disappearance of the sandstones and conglomerates from its summit, the ridges on each side merge into the main mountain, and with it form the broken and knobby region terminating the range. These are known in Walker and Chattooga counties as shinbone ridges, and in Dade county as pudding ridges.

East of Lookout and Pigeon mountains, at distances of from 10 to 20 miles, is another series of mountains extending nearly centrally across this division of the State. These are mostly sharp-topped, and have altitudes of from 500 to 1,000 feet above the sur-

rounding valleys. White Oak mountain, Taylor's ridge, and Gaylor mountain extend in a direct line across this part of the State, only separated from each other by narrow gaps. To the east of these mountains, either in interrupted parallel ranges or divergent spurs belonging to the same system of elevations, are Dick's ridge, Rocky Face, Chattoogata, Horn's, John's, Little Sand, Rocky, Lavender, and Horse Leg mountains. Little Sand mountain and Rocky mountain are table-lands of small extent belonging to the Coosa coal field. The surrounding sharp-crested mountains here bear the lithological relation to these table-lands that the shinbone and pudding ridges, before described, bear to Sand, Lookout, and Pigeon mountains on the northwest.

Next on the east are the Cohutta, Salicoa, Pine Log, Allatoona, and Dug Down mountains, constituting a single range, and extending around the eastern and southern boundary of this division of the State, being, in fact, the eroded escarpment of an elevated plateau that lies to the southeast of this region. This feature of the range is quite apparent in Polk county, where the brow of the escarpment is but 500 or 600 feet above the valleys on the northwest and corresponds to the general level of the country to the south; but in the northern part, especially in the Cohutta mountains, where the altitude is much greater, it is cut up by coves and ravines, so that mountains are encountered in all directions for a distance of 10 or 15 miles between the base and the summit of the escarpment.

To recapitulate: The ranges in this division of the State may be designated by the most prominent mountains of each, as (1) the Lookout range, on the west; (2) the Chattoogata range of the central portion of this region; and (3) the Cohutta range, on the eastern and southern border. Intermediate between these mountains are a number of cherty ridges and sometimes sandstone ridges, rarely exceeding 200 or 300 feet in height. The sandstone ridges are generally narrow, while the cherty ones form knotty belts of from 1 mile to 10 miles in width. These alternate with shale and limestone valleys, thus subdividing the areas between the mountains into somewhat narrow belts, with topographical and agricultural features varying with these lithological characters. The valleys range in altitude from 500 to 600 to 1 000 feet above the sea, the ele-

vation being greatest about the divide between the waters of the Tennessee river on the north and the Coosa river on the south.”*

Kind of Rocks.—The aggregate thickness of the palaeozoic is estimated at about 20,000 feet. The rocks consist mainly of alternating series of shales, limestones and sandstones, or conglomerate. The siliceous rocks, including the sandstones and conglomerates, siliceous shales and cherty beds associated with some limestones, are greatly in excess of the limestones and argillaceous shales, constituting perhaps more than half of the entire thickness, while the argillaceous beds, or such as are composed largely of clay, are somewhat in excess of the limestones. In the upper half of the series these materials are more nearly equal in their distribution.

SILURIAN.

ACCADIAN.—Along the western escarpment of the Cohuttas exist beds of semi-metamorphic slates, and conglomerates apparently of very great thickness. To this formation, in Tennessee, has been given the name of Ocoee group, from the Ocoee river, along which, near the line of Tennessee and Georgia, the rocks appear to have their greatest development, or at least are most prominently displayed.

The group as yet is not known to contain fossils, but has been referred on the ground of its supposed stratigraphic relations to the Accadian Epoch. A sandstone of several hundred feet in thickness is conspicuously displayed in steep ridges or mountains skirting the western base of the Cohutta, Pine Log and Allatoona Mountains. This is the Chilhowee sandstone of Tennessee, and is believed to be the equivalent of the Potsdam sandstones. In Tennessee, *scolithus* impressions—worm holes filled with sandy rods, somewhat softer than the body of the rock—are mentioned as a common characteristic of the sandstone by Prof. Safford, and indicate a probable identity in age with the Potsdam sandstone of New York. These markings have not yet, so far as known, been observed in this State, but the sandstones are often filled with small rounded concretions, that disappear from the weathered surface, and give much the appearance presented by a cross section of the scolithus rods in sandstone.

This is succeeded by hard glauconitic shales and glauconitic

* VI vol. 10 census, page 285, Cotton Production of Georgia, page 19.

sandstones, associated with siliceous limestones, found in a broad belt of country along the Coosa river, and give rise here to what is known as the Flatwoods. Some portion of the same group is found in a belt of country in the eastern portions of Gordon and Bartow and the southern part of Murray, and also come to the surface again for a few miles in sterile ridges on the western side of Whitfield county, between Dick's Ridge and Chattoogata Mountain. Trilobites are found in some of the shales and limestones, and are abundant in the Flatwoods, near Livingston, in Floyd county.

A prominent mineral characteristic is the common appearance of green sand or glauconite in the shales and sandstones, and sometimes in the limestones. This green sand may be found, on close examination, in most of the shales and sandstones, and is sufficiently abundant in some to give them a decided green color.

Galena (lead ore) is found associated with calcite in small ramifying veins and in pockets in some of the siliceous limestones of this group.

KNOX SHALE.—Shales and limestone of an estimated thickness of 3,500 feet. The shales are more or less calcareous, and are generally of a light green shade of color, below the water surface, but weather into a great variety of shades from buff to red, blue, green, brown and black, but is most generally some shade of brown. These shales exist in all the counties in Northwest Georgia except Dade, and are found in a number of long valleys, varying from half mile to one or two miles in width, constituting a large part of the area of cultivated lands in this section of the State. Among these are the Oothkalooga valley of Bartow and Gordon, the Coohulle and Dogwood valleys of Whitfield, and the Chattooga valley of Walker and Chattooga.

The limestones are generally oolitic, consisting of spherical or oval concretions, usually the size of the roe of fish, but in some beds as large as one-third of an inch in diameter. The oolitic particles show under the microscope both a concentric and radiated structure. The limestone generally abound in calcite veins and makes a beautiful marble when polished, the calcite veins forming a reticulated net work of white lines on a dark blue ground. Galena has been found in this limestone near the Catoosa line in Tennessee.

KNOX DOLOMITE.—This covers 894 square miles, or about one-fourth of the entire extent of Northwest Georgia. In Dade it makes

its appearance only in a small patch in the southern part of the county, but covers large areas in all the other counties in this section.

Surface Features.—This formation gives rise to ridges or knobby belts of country from one to ten miles in width, and from one hundred to three hundred feet above the adjacent valleys. These are usually steep along the outskirts, but the central portion of the broader belts usually have a valley surface. There are seven or eight belts of this character, some of which are continuous, across this portion of the State, extending into Tennessee and Alabama, and are known nearly everywhere by the name of "The Ridges." The surface is everywhere covered with *chert*, a gray siliceous rock, usually porous and of uneven fracture, in fine gravel, and in larger fragments, rarely exceeding a foot in diameter.

Kind of Rock.—The formation is made up largely of dolomite or magnesian limestones, from which the group takes its name, associated in alternating layers with siliceous beds. The latter is an impure flint, or a hornstone, and is the material that gives rise from weathering to the *chert*, with which the hills are covered. It exists both in layers of varying thickness between the limestones and in nodular masses encased within the limestone beds.

The hornstone is of a dark blue color, resembling flint in appearance, but, unlike that material, is very brittle, and breaks with an irregular and not a conchoidal fracture. It weathers into a porous stone, usually of a light gray color, but presents various shades of blue, red and brown, to black.

The limestones, as has been said, are generally dolomitic or magnesian limestones. There are, however, at the top of the series some purer limestones alternating with these in beds of five or six feet in thickness. The dolomites are often crystalline, and usually of a gray or dove color.

Variegated argillaceous limestones abound near the upper portion of the series. The magnesian limestones are burnt for lime at Cartersville and at Cement, in Bartow, and at Graysville, in Catoosa, and makes a most excellent lime for mechanical purposes. At Cement some of the beds are used for hydraulic cement. Galena, associated with fluor spar, is found in some of the chert beds in Catoosa county. Most of the limonite deposits of Northwest Georgia are on the cherty ridges of this formation. Manganese and baryta are also found in such situations.

The limestones of the ridges rarely appear at the surface. These have been leached out and lie buried usually to the depth of one hundred feet beneath fragments of chert and the less soluble materials of their own composition, and it is commonly necessary in digging wells to pass through this debris to the undisturbed beds for lasting water. The material above the limestone has most commonly lost all appearance of the original stratification, or if perceptible at all, the beds are much disturbed by caving or breaking into the spaces from which the limestones have disappeared. The drainage of the formation is to a large extent under-ground streams. The water that falls in rain finds a ready entrance through the loose surface material and finds an outlet in the numerous springs that are found at the base of the ridges. Most of the bold limestone springs, so common in this part of the State, have their source in this formation.

There are no streams in the ridges except in the rainy season. In a few localities some of the larger streams have cut their way through the formation from one valley to another. The formation is an interesting one, and doubtless a most important one for future research. Buried as it is in its own ruins, it is as yet but little known.

TRENTON.—This formation consists of limestones and calcareous shales. It gives rise to long valleys, bordered on one side, and sometimes on both sides, by the cherty ridges above described, or, when succeeded by newer formations, by sharp-topped sandstone ridges. The formation is represented in Cedar Valley of Polk county, in Red Clay Valley of Whitfield, and in the dry valleys of Walker and Chattooga, in all of which it is bounded by the ridges of the underlying Knox Dolomite. In the other localities of its exposure it is succeeded on one or both sides by upper Silurian sandstones, as around the mountains and ridges of the Chattooga range, on the eastern sides of Lookout and Pigeon, and in Lookout Valley of Dade county.

Surface Features.—The surface is rolling with few fragmentary surface rocks. Where the angle of dip is great, the limestones, which constitute a large portion of the formation, rarely appear at the surface, but where the strata is nearly horizontal, these often outcrop in broad, exposed ledges, or with a light covering of soil, and with a growth of cedar and scrubby post oak.

MEDINA SANDSTONE is found only in the Chattoogata Range.* The sandstones have a thickness of four hundred feet.

CLINTON IRON ORE RIDGES.—This group west of Taylor's ridge consists of sandstones and arenaceous shales, of three hundred and fifty feet thickness. In this ridge and to the east of it the rocks are hard sandstones almost throughout and in Chattoogata mountain have a thickness of four hundred and twenty feet. The group contains three beds of red fossiliferous iron ore varying from a few inches to ten feet in thickness.

ORISKANY.—A siliceous skeleton a few inches in thickness with some of the characteristic fossils of this group has been found near Ringgold in Taylor's Ridge.

DEVONIAN.

The Devonian is represented in a bituminous shale with a thickness varying from five to eighty feet. This is well known in the country as the "black shale," and from its bituminous character is often mistaken for coal. This with its pyrotous character has stimulated much useless digging, and petroleum which it may be expected to furnish is among minerals of economic importance that has not been looked for. A blue shale at the top of a foot or more in thickness contains phosphatic nodules. The shale is overlain by siliceous beds with geodes and locally by brown calcareous shales with the geodes.

CARBONIFEROUS.

The sub-carboniferous consists of a siliceous group at the base of the system of two hundred and fifty feet. The limestones abound in flint nodules—the material of Indian flint implements. A heavy bedded blue limestone of four hundred feet thickness overlies the siliceous group and constitutes the upper group.

Coal Measures.—This covers an area of about two hundred square miles in the State. The larger part of this is in Sand and Lookout Mountains. Small areas belonging to the Coosa coal field exist in Rocky Mountain of Floyd and Little Sand Mountains of Chattooga.

The rocks consist of: 1. Two hundred feet of shales with a bed of coal at the top; 2. Two hundred and fifty feet of conglomerate and sandstones; 3. Four hundred feet of thin bedded sandstones and shales with four beds of coal.

*This system of mountains and ridges includes the Chattoogata, Rocky Face, John's, Horn's, Lavender and Gaylor Mountains, and Dick's and Taylor's Ridges.

MESOZOIC.

TRIASSIC.—Strata of the Triassic system, so well developed in the Connecticut valley, are not known to extend into Georgia. It exists in North Carolina in two synclinal folds containing five beds of coal and extending southward into South Carolina. It rests non-conformably on the metamorphic in those States.

Trap dikes so common in the metamorphic in Georgia are believed to be of Triassic age. The dikes extend about north 20° west cutting the strata nearly at right angles to the strike of the rocks. These are rarely as much as one hundred feet in width, and most commonly only a few feet, and vary greatly in the same dike. One of the largest extends through Talbot, Meriwether and Coweta. They are common throughout Middle Georgia south of the Chattahoochee Ridge.

The trap weathers into dark rounded boulders, that commonly cover the hillsides along the dike and to which the name of "Niggerheads" is commonly given.

CRETACEOUS.—This formation covers a small triangular area, extending from Columbus southward along the State line to Pataula creek and eastward to the northeastern part of Schley county.

Dr. Loughridge, formerly an assistant in the Geological Survey of this State, says: "In its surface features it differs from the region in the other States in a total absence of the black prairies and of any outcrop of rotten limestone. The beds are covered almost throughout by red clays and deep white sand, forming a rolling and well-timbered country. Passing southward along the river, from the metamorphic rocks at Columbus, we find, at first, beds of plastic and purple clays (exposed only for a short distance). Near the mouth of Upatoi creek, 8 miles south of Columbus, blue micaceous sands and clays form abrupt cliffs along the river for a number of miles, and dipping to the southwest at a slight angle, are overlaid by heavy and yellow clays more or less fossiliferous, and probably the representatives of the rotten limestone group.

"At Georgetown. Quitman county, and thence to the border of the tertiary, the highly fossiliferous beds of blue marl and their ledges of limestone of the Ripley group are exposed along the river bank and preserve the same slight southwest dip."*

The general features of the country are much like those of the

*Cotton Culture 10 Census, VOL. VI, page 280.

Tertiary region of the State; in fact it seems that a large part of the area usually defined as Cretaceous is covered by somewhat superficial deposits of Tertiary sands, the marl beds with the characteristic Cretaceous fossils being found only in the beds of streams or on eroded hill-sides near them. It is not improbable that the Cretaceous may yet be traced in this way much farther eastward in this State. The formation is not known to have any minerals of much economic importance. Some of the marl beds contain potash in considerable quantity, and when this is the case such marls may be used with profit as a fertilizer in the immediate section in which they are found.

Greensand Marls are found along the banks of the Chattahoochee river. These are exposed for several miles on the banks of the stream in Stewart county, in beds of fifteen to twenty feet. The bed dipping slightly to the southwest, disappears in this direction beneath the bed of the river. No complete analysis has been made of this marl but a test for potash shows from one to two per cent. of that element.

CENOZOIC.

TERTIARY.—This formation covers about one-half of the State, embracing all south of the *Metamorphic*, except a small triangular area near Columbus, and a narrow belt of more recent deposits on the coast. It crosses Georgia in a broad belt with an average width of 175 miles, widening out as it extends southwestward across the State.

Surface features.—The country near the coast is level and sandy, but at the distance of from fifty to seventy-five miles inland, becomes undulating and the surface is very generally covered with a small ferruginous concretion. These pebbles are about the size of buckshot, and where these are most abundant the name of "buckshot land" or "pebbly land" is commonly applied to distinguish these either from the more sandy lands or such as have these concretions in less abundance.

There are but slight inequalities of surface, except near the principal streams, which are from fifty to seventy-five feet below the general level of the country. The low rounded hills rarely exceed ten feet away from the water courses, affording only enough irregularity generally for good surface drainage.

Another and quite different surface feature is presented in what is known as the Lime-sink region. This extends southwest from Scriven

county across the State, widening out into a broad belt of country in Southwest Georgia. The country abounds in lime-sinks and in some sections in small lakes—lime-sinks filled with water. The whole country is full of depressions or sinks, in many places giving only a slight inequality of surface, that of a network of low ridges—a sort of honey-comb topography in low relief.

This is a country of subterranean streams. The surface drainage is not generally good. The water that falls must find its way either through open sink-holes, or else by filtering through the soil, into the under-ground channels. The marl beds found at depths of from twenty to fifty feet is the water-carrying stratum of the country. Some of these under-ground waters find outlets in bold limestone springs. These are more common along the southwest border of the lime-sink belt. The general direction of the streams, as shown by the lines of sinks, conform to the southern or southeastern inclination of the strata and to the general direction of the surface drainage in South Georgia. Ponds, lakes and swampy lands have been successfully drained by boring through to the marl beds, allowing the water a ready escape into under-ground channels.

Kind of Rocks. The formation is largely made up of sandy layers alternating with clays and calcareous marls or limestones. Most of these exist in a soft or friable condition. The marls or limestones; the Buhrstone; a feruginous sandstone, in thin layer occurring about the upper border of the formation, and the buckshot concretions, before mentioned, are, nearly the only rocks of sufficient hardness not to crumble in the hand, or break down on exposure.

The Buhrstone is found near the upper limit of the lime-sink belt, and is itself a siliceified portion of the marl beds. This stands out in bluffs on some of the streams. Some fine exposures of the bed are found on the Savannah river in Scriven county. It does not appear to extend across the State in a continuous bed, as do the marl beds, but is found with interruptions along its northern limit, as shown by the Mineral Map of the State.

QUATERNARY.—At the close of the tertiary remarkable changes took place in the climate of the earth. A large part of the northern hemisphere was covered with glaciers, and arctic animals were driven by the extreme cold into the temperate and semi-tropical regions. The effects are observed in the drift of high latitudes—transported materials, such as sand, clay and rounded boulders, with

which the country is covered as far south as Pennsylvania and Ohio. From this phenomenon the first part of the Quarternary is designated by the name of the Glacial Period or that of the Drift or Ice Age. This was succeeded by the Champlain Period and the Recent or Terrace Epoch.

The melting of the glaciers as the closing event of the Ice Age brought on a flood of waters and gave rise to a flood-made deposit, covering with sand and pebbles the older formation in some parts of the Mississippi Valleys. A deposit of sand and pebbles along the upper border of the Tertiary in Georgia has been thought by some geologists to have had a like origin.

The low hammock lands, the estuary and delta formations near the coast and the alluvium of streams, the swamp muck and stalag-metic cave deposits in all parts of the State, as well as some local drifts in the coves and at the mouth of mountain ravines, belong to this age.

CHAPTER VI.

AGRICULTURAL GEOLOGY.

Under this head, the several geological formations of the State will be dealt with in their agricultural relations.

Soils have their origin in the decay and disintegration of the rocks, and where a soil rests on the stratum from which it is derived, it is always closely related to this in composition. Some soils, however, are brought in part or entirely from a distance, and may have their sources in the wearing down of rocks wholly different from the ones on which they rest. These are transported soils. The alluvial deposits, the material of which is derived from the diverse strata traversed by the streams, is generally of this character. There are no extensive areas in Georgia, as in some of the Northern States, covered with drift material brought from remote localities. The soils of the State elsewhere than in the alluvium of streams, with rare exceptions, are derived either from underlying rocks, or else from immediately adjacent groups.

In crossing the country northwest and southeast, in Northern and Middle Georgia, frequent well marked changes in the soil and growth of timber are observed that point with much certainty to corresponding changes in the underlying rocks.

In the account given of the soils of the State in the following pages, reference is made to the geological groups to which these belong, and which are described more in detail on preceding pages.

NORTHWEST GEORGIA.*

The following table gives the geological divisions that are represented in this region, and also the thickness of each group. The lithological features of each group varies somewhat in the eastern and western sections, and it is of sufficient interest to represent this in the list by making Taylor's ridge (a prominent and sharp-topped mountain chain in the middle of the region) a dividing line and in the two columns showing the features of each group.

*The descriptions here given of the soils of this part of the State are extracted from Professor Hilgard's Report on Cotton Culture, published in Vol. VI, 10th Census. This was prepared from geological notes and maps now in the office of the Department of Agriculture.

LITHOLOGICAL GROUPS.			
Geological formations.	West of Taylor's Ridge.	East of Taylor's Ridge.	Thick- ness.
			<i>Feet.</i>
Carboniferous.	<i>Thin-bedded sandstones and shales, with coal</i>	<i>Thin-bedded sandstone and shale.</i>	200
Subcarboniferous.	<i>Conglomerates and heavy-bedded sandstones</i>	<i>Conglomerates and heavy-bedded sandstones</i> ...	150
	<i>Shale, with bed of coal at top.</i>	<i>Shales</i>	200
Devonian.	<i>Heavy-bedded blue limestone</i>	<i>Argaceous shales and bituminous limestones.</i>	300
	<i>Siliceous limestone, with flint nodules.</i>	<i>Siliceous limestone, with flint layers and nodules</i>	250
	<i>Siliceous limestone, with geodes.</i>	<i>Calcareous shales, with geodes</i>	75
	<i>Black bituminous shale</i>	<i>Black bituminous shale.</i>	40
	<i>Blue shale, with phosphate nodules.</i>	<i>Blue shale, with phosphatic nodules</i>	5 to 15
Oriskany. ....	.....	<i>Siliceous skeleton [limestone?]</i>	1
Clinton	<i>Sandstone and argaceous shales</i>	<i>Sandstone, with beds of iron ore</i>	420
Medina	<i>Calcareous shales, with iron ore</i>	<i>Heavy-bedded sandstones</i>	410
Cincinnati	<i>Calcareous shales</i>	<i>Argillaceous sandstones.</i>	200
Trenton,	<i>Thin-bedded blue limestone and calcareous shales</i> ..	<i>Red and dove-colored rotten limestone.</i>	1,000
Chazy.	<i>Thin-bedded blue and gray limestone and calcareous shales</i>		
Upper Quebec, Knox D	<i>Limestone, with heavy beds of chert</i>	<i>Limestone, with heavy beds of chert.</i>	5,000
Lower Quebec, Knox S...	<i>Argillaceous shales, with beds of oolitic limestone</i>	<i>Argillaceous shales, with oolitic limestone.</i>	2,500
Calcareous and Potsdam	.....	<i>Glauconitic shales and sandstones</i>	1,000
	.....	<i>Sandstones.</i>	(?)
	.....	<i>Argillites</i>	(?)
Buronian .....	.....	<i>Conglomerates, slates, gneisses, mica-schists.</i>	(?)

NORF.—The groups that afford arable lands are in italics; the others in general enter into the structure of steep mountains and ridges.

The soils of the different groups are well characterized, each affording one in many respects peculiar to itself. For this reason it will be most convenient to consider separately the soils of the formations that give rise to arable lands.

The following comprise the chief varieties:

1. Brown and red loams. 2. Gray siliceous soils of the ridges. 3. Sandy table or mountain lands. 4. Flatwoods. 5. Alluvial lands.

BROWN AND RED LOAMS.

These are formed from the limestone and calcareous shales of several geological formations, and, as they differ somewhat, they are described separately.

Lands of the Chazy and Trenton.—The lands are highly calcareous, and are perhaps the richest uplands in the State. The timber is large, and consists principally of red, Spanish, and white oaks, hickory, poplar, sugar maple, post oak and cedar, with an admixture of other varieties common to the country. The lands generally lie well, but when hilly are inclined to wash. Where the limestones are nearly horizontal, these are sometimes exposed, or else lie in close proximity to the surface. Such lands are usually covered with a growth of cedar and red haw, and are known as cedar glades; but there are no very extensive areas of this kind. Where the limestones lie unexposed near the surface, this fact is usually indicated by a growth of post oaks.

The soil consists of two principal varieties, viz., a brown calcareous loam of the blue limestone areas and red calcareous loam of the rotten limestone.* The first varies in color from a light to dark brown and almost black, a dark or chocolate brown being the most characteristic color, with a subsoil approaching to red. The soil of the rotten limestone belts is a dark red color with a red subsoil. There is a striking difference in the appearance of these lands, though in the more essential characteristics of productiveness and in adaptation to various crops there is little difference. Lands that have been in cultivation for thirty or more years will often produce from 30 to 50 bushels of corn to the acre. The soils seem to be considerably deteriorated for the wheat crop, but when rested in clover, and the crop turned under, from 10 to 20 bushels is not an unusual yield. Cotton has been grown but little on these lands north of Floyd county, and in this county and Polk about 600 pounds of seed cotton per acre is the usual yield.

Subcarboniferous brown loam lands.—The rocks of this formation

*The blue limestone areas are on the eastern and the western sides, and the rotten limestone in the central part of this division of the State.

consist of limestones, arenaceous shales, and siliceous or cherty limestones. The lands, which are generally rolling, but sometimes nearly level where the valleys are broad, have a brown soil that is calcareous and siliceous, or sandy, with sufficient clay in the sub-soil to give it a somewhat retentive character, and yet admit of good drainage, even where the lands are nearly level. The areas of this character are in the valleys immediately around Sand, Lookout, and Pigeon mountains, in the broader valleys immediately east of Taylor's ridge, and again east of Horn's mountain, viz.: West Armuchee valley, in Walker county; Sugar valley, in Gordon; Dirt Town valley, in Chattooga, and Texas valley, with a large portion of the country to the west of Coosa river, in Floyd county. These are decidedly the best cotton uplands in this part of the State, yielding often without fertilizers from 1,000 to 1,200 pounds of seed cotton to the acre. They seem to be especially adapted to the cotton crop, but corn, wheat and oats do well.

The Cincinnati Group and the lower portion of the *Clinton Group*, in Dade county, and along the eastern side of Lookout mountain and around Pigeon mountain, in Walker county, consist of green calcareous shales that weather to a yellow or orange color. The rocks outcrop in the hills or on the slopes of the ridges around these mountains, and the lands to which they give rise are rich, and are very generally under cultivation. The soil is yellow or orange colored and rather argillaceous in character, though there is an admixture of fine sand and gravel that renders it easy of tillage. The steepness of slopes and character of soil predispose the lands to wash, and horizontal hillside plowing is necessary to prevent washing. These lands are well adapted to corn and wheat.

Where these formations occur east of Lookout and Pigeon mountains they are represented by hard siliceous shales and sandstones, and in this character contribute largely to the materials of which the Chattoogata range of mountains is built.

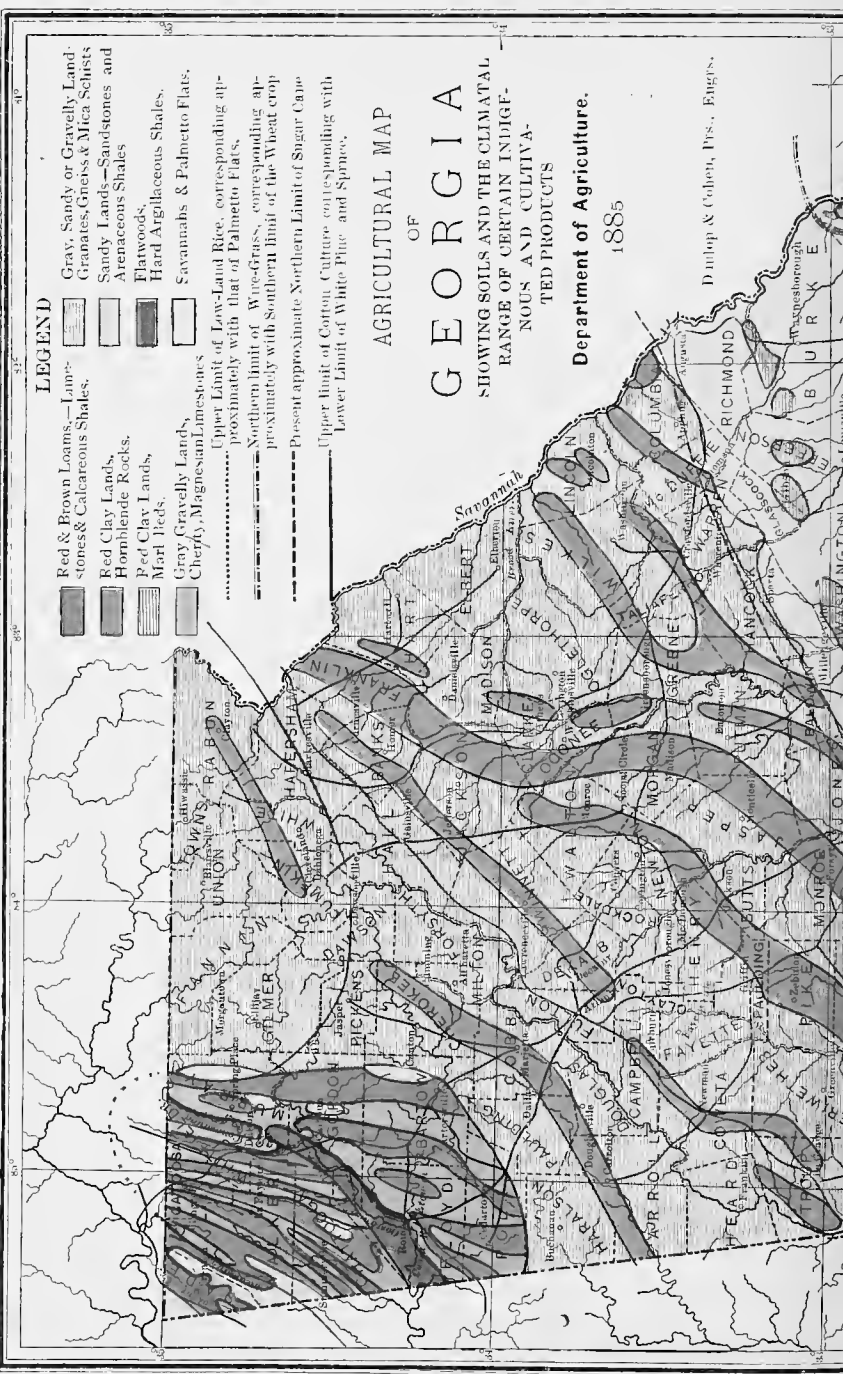
Knox Shale.—These lands are underlaid by a series of shales and limestones of about 2,500 feet thickness. The region covers in Georgia about 400 square miles, occurring in belts of from half a mile to two or three miles in width, and is found in all of the counties of this section except Dade.

The formation affords an argillaceous soil of an orange or light color, and of great importance, nearly the entire area consisting of

slightly rolling or nearly level lands, most of which have long been under cultivation. This soil contains more clay in general than most of the other good lands of the region, but is more or less calcareous, and contains a sufficient amount of sand or fine gravel, derived in part from bordering cherty ridges, to promote easy culture. The clay beneath the soil has varying depths off from one foot or two to 15 feet down to the shales, but rarely less than four or five feet. The generally rolling character of the land is sufficient for good drainage. The forest growth is red, white and Spanish oaks, hickory, dogwood, chestnut and pine; the principal agricultural products, corn, oats, wheat, clover and grasses, and cotton. Land of this character that has been kept in cultivation for thirty or more years, with little or nothing returned to the soil for its improvement, will now produce about 20 bushels of corn, six bushels of wheat, and 10 bushels of oats to the acre. These lands are, however, capable of a high degree of improvement, and where they have been properly kept up the yield is good. They rank as about third-rate uplands in relation to cotton culture, and with fertilizers will produce about 500 pounds seed cotton per acre. The lands, where hilly, are inclined to wash; but this can generally be prevented by horizontal plowing, though they are rarely so steep as to require this. The valleys in which these lands occur are supplied with numerous springs, running from the bases of cherty ridges that border them on one or both sides, and water is easily obtained in wells, that do not require curbing, at depths of from 20 to 40 feet.

(e) GRAY GRAVELLY LANDS OF THE RIDGES (*Knox Dolomite*.)

The lands have a gravelly soil, varying in color from light to dark gray, with generally a porous gravelly subsoil; but in some places there is a good clay subsoil, with a gravelly soil of a dark brown or red color. These lands are generally regarded as poor, and are for the most part in the original forests. The prices range from 50 cents to \$3 per acre, according to situation, the highest values being given to such as adjoin the valley lands, without regard to their adaptation to culture. Recently attention has been attracted to these as among the most profitable lands for cotton. They are found to give a better *immediate return* for manures than the richer valley lands, and their present cheapness and comparatively easy culture, with their general healthfulness, give them additional importance.



LEGEND

- Red & Brown Loams.—Limestones & Calcareous Shales.
- Red Clay Lands.
- Red Gravelly Lands.
- Gray Gravelly Lands.
- Cherty, Magnesian Limestones.
- Gray, Sandy or Gravelly Lands.
- Granites, Gneiss & Mica Schists.
- Sandy Lands.—Sandstones and Arenaceous Shales.
- Flatwoods.
- Hard Argillaceous Shales.
- Savannahs & Palmetto Flats.

Upper Limit of Low-Land Rice, corresponding approximately with that of Palmetto Flats.

Northern limit of White-Grass, corresponding approximately with Southern limit of the Wheat crop.

Present approximate Northern Limit of Sugar Cane.









Upper limit of Cotton Culture corresponding with Lower Limit of White Pine and Spruce.

AGRICULTURAL MAP OF GEORGIA SHOWING SOILS AND THE CLIMATICAL RANGE OF CERTAIN INDIGENOUS AND CULTIVATED PRODUCTS

Department of Agriculture.
1885

Dunlap & Cohen, Prs., Engles.

LEGEND

- | | | | |
|-----------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------|
|  | Long-Leaf Pine. |  | First or Greatest Degree of Density. |
|  | Short Leaf Pine. |  | Second Degree of Density. |
|  | Oaks and other hard woods, with Short-Leaf Pine. |  | Third Degree of Density. |
|  | Oaks and other Hard Woods, with White Pine. | | |
|  | Live Oak, Palmettos, Bays. | | |

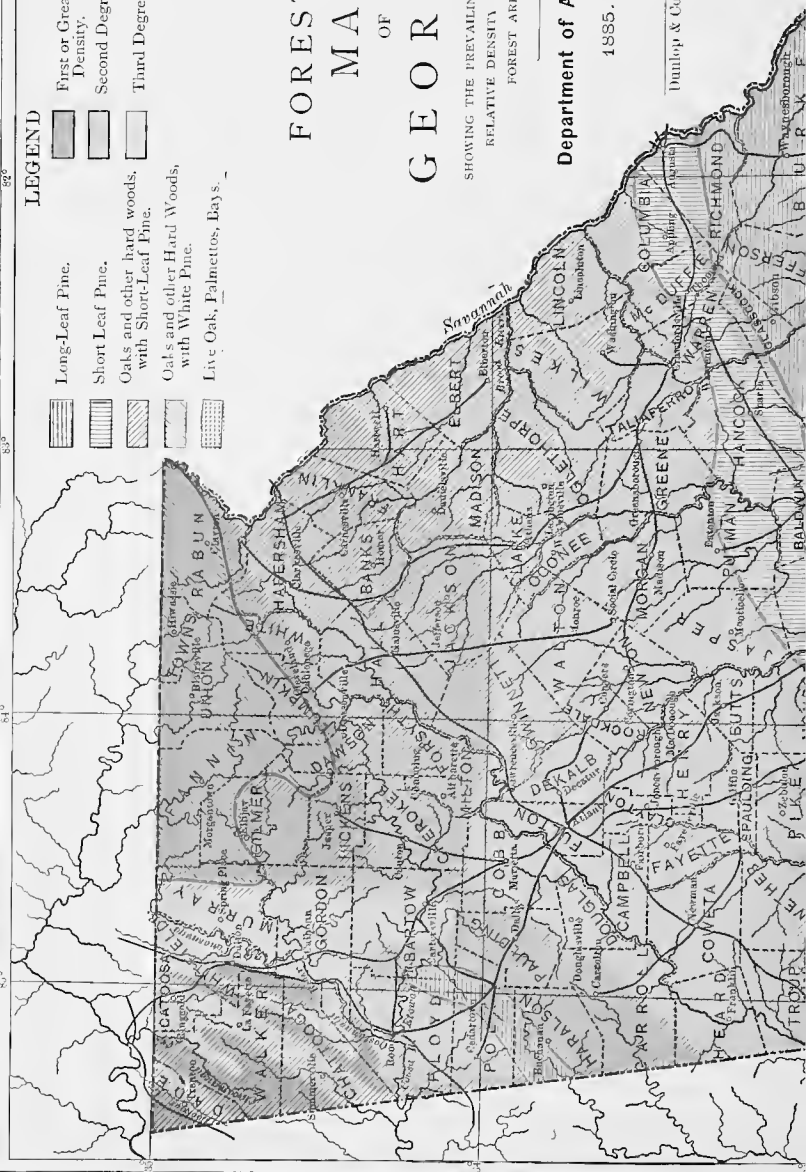
FORESTRY MAP OF GEORGIA.

SHOWING THE PREVAILING TIMBERS AND
RELATIVE DENSITY OF EXISTING
FOREST AREAS.

Department of Agriculture.

1885.

Dunlap & Coles, Pts., Engs.





Scale 0 25 50 75

100 Miles

The timber is of good size, and consists of red, black, mountain, post, white and Spanish oaks, chestnut, pine, hickory, dogwood, sourwood and black gum. The oaks predominate, but chestnut and short-leaf pine are generally abundant. When the belts are broad and the lands nearly level, as in some portions of Bartow and Polk counties, the long-leaf pine is the prevailing growth. Hickory is common, especially where there is a somewhat compact sub-soil, and the mountain oak is only found upon the high and steep portion of the ridges. Notwithstanding the hilly character of these lands, they are less liable to injury from washing than most of the uplands, the gravel and small stones with which the surface is covered, as well as the pervious character of the soil, protecting it. The cotton crop is less subject to injury from continued wet weather in the spring than on most other soils, and comes to maturity early, rarely failing to open well. The production with fertilizers is about 1,200 pounds of seed-cotton per acre. Corn does not do well on these lands after a few years' cultivation, except in very rainy seasons. With the use of fertilizers wheat might be made a profitable crop, as it is less subject to disaster and nearly always matures a better developed grain than on the richer valley lands; but without fertilizers it does not "tiller" or spread well, and the average yield is not so good. The lands are well suited for fruit culture, the trees being healthy and long lived, and the tops and slopes of ridges here, have an immunity from late spring frosts, that often kill the fruit on lower lands.

Dr. Longbridge, in speaking of the analyses of the soils of this group, says: "These lands are remarkably rich in potash and phosphoric acid, with a sufficiency of lime to insure their availability for the present at least. The generally prevailing idea that these ridge lands are of no value agriculturally is shown both by this result and by actual tests to be a mistaken one."

SANDY LANDS OF THE MOUNTAIN SUMMITS (*Carboniferous*.)

The portion of the Carboniferous series above the conglomerates, consisting of sandstones and sandy shales, gives rise to a gray or yellow sandy land, more or less gravelly and rocky. The soils of this character are, on table lands, from 1,000 to 1,200 feet above the valleys. Sand mountain, in Dade county, Lookout mountain, in Dade, Walker, and Chattooga counties, and Little Sand mountain,

in Chattooga county, afford the lands of this character, the total area of which is about 200 square miles. The topography varies from nearly level to rolling and hilly. The daily range of the thermometer here is about 50 per cent. less during the summer months than in the valleys, though the daily minimum temperature is usually but 2° or 3° less. Owing to this average low temperature, these lands are thought to be unfit for the growth of cotton, to which otherwise they would seem to be well suited. They are especially adapted to fruit culture and to a great variety of vegetables.

A variety of mineral springs is found on these table-lands, and these, together with the pleasant summer climate, give importance to this region as a health resort. The timber is of medium size, consisting of mountain, white and red oaks, chestnut, pine and hickory, with less undergrowth than is common to other woodlands in this part of the State, and with a good coat of grass covering the surface nearly everywhere.

“FLATWOODS” (*Potsdam and Calciferos.*)

These formations are made up of sandstones and hard siliceous and argillaceous shales, with siliceous limestones in certain localities. The siliceous shales are most abundant in the upper part of the series, and these are often glauconitic, while the sandstone occurs in both the lower and upper beds. Owing to its somewhat varied lithological character, the topography is correspondingly diversified with mountains, hills, and nearly level “flat woods,” but the soils are nearly everywhere of one general character, at least with regard to sterility. The most extensive area of these lands is that of the flatwoods near the Oostanaula and Coosa rivers, in Gordon, Floyd, and Polk counties, and a mountainous section south of the Coosa river, in Floyd and Polk counties, belonging to the same formation, and with which these flatwoods are continuous. It occurs again in a belt of hills in the southern part of Murray county, extending southward nearly across the county of Gordon. In the eastern part of Catoosa the glauconitic shales, with sandstones, are found in a narrow belt extending southward into Whitfield. It affords a thin soil of a gray or light brown color, with but little depth above the hard shales and sandstones, and the lands are generally regarded as unfit for cultivation. This land abounds in short-leaf pine, with post and red oaks as its principal forest growth.

ALLUVIAL LANDS.

In the mountains, where the streams are rapid, the alluvial lands have but little extent, but in the valleys the creek and river bottoms are comparatively broad. The bottom lands vary from about one-eighth of a mile on small streams to one or two miles on the larger ones, the greater part of their width being generally on the western side of the stream. The alluvial deposits of small streams vary more in character, those of the larger ones in general being most productive.

Alluvial lands, with a large proportion of sand, are the only ones on which cotton has been grown with success, the Coosa and Etowah rivers affording some of the best cotton lands in this part of the State.

MIDDLE AND NORTHEAST GEORGIA.

The lands of Middle, Northeast and Southern Georgia have been well described by Dr. R. H. Longhrige in the Report, on Cotton Production of the State of Georgia prepared under the direction of Prof. Eugene W. Hilyard for the 10th census, and the description of the soils of these sections on the following pages is extracted from this report.

SOILS OF MIDDLE AND NORTHEAST GEORGIA.

Red Lands.—Under the designation of *red lands* are included both red sandy and clayey soils, from whatever source they may be derived. Hornblendic rocks, by decomposition, form a red clayey soil, more or less sandy for a few inches, but have a deep red-clay subsoil. The color and character of the soil is as varying as is the proportion of hornblende and associated minerals in the rock. Biotite mica contains also much iron, and, if present very largely in the rock, forms by decomposition deep mulatto or sometimes red soil having the same general appearance as that from hornblendic rocks, but usually lighter in character.

Topography and character of the soils—The surface of the country occupied by these red lands is rolling or undulating and often somewhat hilly, there being but few very level areas, and then not in very large tracts. Very little is too broken for cultivation.

The growth is red or Spanish, white and post oaks, hickory, chestnut, dogwood, and some short-leaf pine, with poplar, ash, wal-

nut, cherry, and buckeye in the lowlands of some of the counties. The proportion of hickory is much larger, and that of pine much less, than on gray sandy land. Black-jack is occasionally interspersed with these. The red lands are usually sandy for a depth of several inches, and hence are rather easily cultivated, especially in dry weather. Decayed vegetation frequently gives to them a dark "black" surface, but the subsoils and underclays are very red. The latter being "in place" and derived from the disintegrated and decomposed rocks, are variegated, showing different colored strata. On these red lands cotton grows very well if the soil is loose and sandy. They are in general difficult to till in wet weather, being sticky, and in dry seasons are very hard and compact.

Except, perhaps, in southern counties, these red clay lands are considered best for small grain (especially oats), as they are cold and their cotton crops are late in maturing. A large portion, probably one-third, of these lands under cultivation is devoted to cotton.

GRAY SANDY AND GRAVELLY LANDS.

The disintegration of the quartz, feldspar, and mica of the gray gneiss rocks produces a loose, sandy, gray soil, more or less clayey, and covered or mixed with gravel and loose quartz-rock. The subsoil is usually a yellowish clay.

The mica-schists, which also are found in large areas, are more or less garnetiferous, and are penetrated by quartz seams and veins of every size. By the disintegration of these schists gray sandy, gravelly land is produced unless there is present much iron or biotite mica, as in the southern part of the region. By the subsequent denudation of the surface of the country the quartz fragments are either left on the surface or transported as gravel and sand to the low country. They are often accompanied by narrow decomposed strata of other rocks of the series, but no material change is perceptible in the lands.

Topography and character of the land.—The surface of country covered by gray lands is always more or less rolling and hilly, but has broad level areas either on the ridges or in the valleys. The slopes of the ridges are so gradual as not to interfere with their successful cultivation, excepting, of course, in the more mountainous districts. Their light sandy nature makes them very liable, when opened up to cultivation, to wash into gullies and flood the lowlands with sands, but the methods of hillside ditching and hori-

zontalizing practiced are successful in preventing such damage. There is comparatively little of the gray lands too broken for cultivation outside of the Blue Ridge mountain region. The growth is generally short leaf pine, post, Spanish (red), and white oaks, hickory, dogwood, and persimmon, with some ash, black and sweet gums, poplar, walnut, and cherry on the lowlands. Pine has not as large a growth as on granite lands, and only the short leaf variety is found.

The soils are coarse, gray, and sandy, frequently colored dark for an inch or two with decayed vegetation, are more or less gravelly, from 3 to 12 inches deep, and have a yellow clayey subsoil. From this intermixture of the soil and subsoil cultivation a yellow mulatto soil is obtained. Loose quartz-rocks or stones are often so abundant on the surface as to require removing before the ground can be broken up.

Though these lands are said to produce late crops of cotton, they are preferred to the red clays, as being more productive, and because they enable the stalks to stand the drought better. They are also easy to till, and a larger area can be cultivated than of the red lands with the same labor. Of the gray lands under cultivation, from one-half to two-thirds is devoted to the culture of cotton. Fresh lands yield from 500 to 700 pounds of seed-cotton per acre, as do also old lands by the aid of fertilizers; but without fertilizers the latter yield only 250 or 300 pounds per acre, or about 100 pounds of lint.

*Granitic Lands.**—Large and small areas of gray sandy soils having outcropping underlying granite rocks are found in many counties of the metamorphic region, but chiefly in its southern half and cover about 2,600 square miles. The rocks often graduate into the gray gneisses in such a manner that the line of separation cannot easily be determined.

Topography and soils.—The surface of the country is generally rolling and broken, with sharply defined and rounded hills in localities which have the granite boulders or rounded masses, and broad level areas when only the flat rock underlies the land. A little hornblende occasionally accompanies the granite, and black tour-

* The principal localities of granite lands are shown by the granite areas on the Mineral Map of the State.

maline crystals are also often found in the quartz-rock near its outcrop.

The almost universal timber growth on all these lands is pine (either long or short leaf) with oak, chestnut, hickory, and some blackjack.

The soil is often a coarse gray or gravelly sand from three to six inches deep, with a subsoil of yellow or red clay more or less sandy, or sometimes a whitish, impervious clay, the result of feldspar decomposition. The soils are reported by some as cold, but are easily tilled and well adapted to cotton culture. About two per cent. of the entire granite lands of the State are reported to be unillable, either from their broken character or because of the exposure of the granite or its near approach to the surface. In Columbia county one of these exposures is said to cover 125 acres, there being nothing but flat and bare rock, having a low scrub growth only in its seams and crevices.

The yield per acre on these lands is about 800 pounds of seed-cotton when fresh and unmanured, equal to 270 pounds of lint. Cultivation rapidly reduces this product to 350 pounds of seed-cotton. Cotton is planted only on the uplands, it being liable to rust on the lowlands.

A noticeable feature in the soils in the granitic region is the increase of both potash and lime over that of other metamorphic soils, both doubtless derived from the feldspars of the granite. The general average percentage of lime in the granitic lands, as shown by analysis, is 0.102, an amount sufficient to make these lands thrifty and more durable than others.

Cultivated lands of the metamorphic region.—In the high and mountainous district of the Blue Ridge region, especially in Towns and Rabun counties, there is a comparatively small amount of land suitable for tillage. The farms are small, and are found principally along the water-courses. In the entire group of ten counties, but 12.3 per cent. of their area (or an average of 79 acres per square mile) is under cultivation.

The lands of the region have a dark or red loam soil, very rich and durable, those of the Little Tennessee valley, in Rabun county, being especially noted for their fertility and excellence; but in

those counties which lie chiefly outside or south and west of the mountains the lands are gray, sandy, and gravelly, with a yellow or red clay subsoil. But little attention is given to the culture of cotton, because of (1) the distance from market and the absence of transportation facilities, and (2) the severe climate of the region and short seasons suitable to the growth of cotton.

Passing southward from the Blue Ridge counties, we find at first a small increase in acreage under cultivation, the average proportion in the counties of Franklin, Hart, Madison, Banks, Hall, Forsyth, Cherokee, and Pickens, being about 38 per cent.; but beyond these, to the pine hills of the central cotton region, the general average of lands that have been or are now under cultivation is about 54 per cent. of the entire area.

The lands north of the Chattahoochee river, on the northeast, have almost entirely gray sandy soils, with but a few strips of red clay. The subsoils are almost universally clays. This section has been designated the "northeast division" by the State Department of Agriculture, and the yield per acre with fair cultivation is reported as follows: Corn, 20 bushels; wheat, 15 bushels; oats, 25 bushels; rye, 8 bushels; barley, 25 bushels; hay, from 2 to 3 tons; sorghum syrup, 75 gallons. Tobacco, buckwheat and German millet can also be grown with great success. The fruits adapted to the section are the apple, cherry, pear, grape, plum in all its varieties, peach, gooseberry, raspberry, and strawberry.

In the rest of the metamorphic or "Middle Georgia" region the products are—

Cotton, corn, oats, wheat, and all the grains and grasses, and even tobacco may be grown successfully. After the coast country, this division was the first settled, and has continued to be the most populous in the State. A large proportion of the land has suffered temporary exhaustion by injudicious culture, which claimed everything from the soil and returned nothing; but this ruinous practice is fast giving way to a more enlightened and economical system. The abandoned fields grown up in stunted pines, and for from twenty to forty years considered useful only as pasturage, have been restored to cultivation, and are now among the most productive lands of the State.

The fruits to which this section is best adapted are the peach, fig, apple, pear, strawberry, and raspberry. The yield per acre of the common crops under ordinary culture is: Corn, 12 bushels; wheat, 8 bushels; oats, 25 bushels; barley, 30 bushels; rye, 8 bushels; sweet potatoes, 100 bushels.

The acreage devoted to cotton is naturally small in the northern counties near the Blue Ridge, and averages no more than 1 per cent. of the entire area under cultivation in a belt of a few miles in width. Southward, the acreage increases rapidly, until in the southern half we find that the percentage of the total area occupied by this crop is 10 to 15 on the east and 15 to 20 on the west, with three counties whose average is above 20 per cent., viz.: Troup, Pike, and Clayton.

LANDS OF SOUTHERN GEORGIA.*

THE CENTRAL COTTON BELT.

Within this central cotton region there are three distinct belts, differing very widely from each other. These are: First, the *sand-hills and pine belt* on the north, and bordering the metamorphic region of the State, its sands also often extending northward and covering some of its rocks; second, the *red hills*, adjoining the first belt on the south; third, the *oak, hickory, and pine, sandy loam uplands*, with clay subsoils, forming, as it were, a transition belt from the red hills to the sandy wire-grass region of the south, and gradually falling in elevation from the hills to the level lands of the latter.

The sand and pine hills.—The records of the State Geological Survey place the northern limit of this belt from a few miles north of Augusta and Thomson, a few miles south of Warrenton and Sparta, to Milledgeville, Macon, Knoxville, Geneva, and Columbus, at which point the metamorphic rocks are found outcropping in the beds of the streams, while the sand-hills extend northward a short distance along the uplands. The southern limit is easily defined by the somewhat abrupt red clay hills along its border. Its

*The lands of this division of the State, as represented on the Agricultural Map of the State, are: 1. Red clay lands. 2. Sandy lands. 3. Savannah and Palmetto flats. The different regions described, with the exception of the coast region and red clay lands, are included in the second-class.

width varies greatly, but is greatest on the east and west, about 25 or 30 miles from each of the large boundary rivers. Between the Ogeechee and Flint rivers it is rather narrow, but widens to the west to 20 miles or more in Taylor and Marion counties. On the Chattahoochee river its southern limit is near the mouth of Upatoi creek. The area embraced in the sand-hills is about 2,950 square miles.

The surface of the country embraced in this belt is high and rolling, and this is especially the case near its northern limit, where the altitude is from 500 to 600 feet above the sea, and sometimes 100 feet or more above the adjoining metamorphic region. Southward the country falls to the foot of the line of red hills, which often rise abruptly from its limit. Again, in other localities, as between the Flint and Ocmulgee rivers, the lower part of the belt presents a broad plateau, which gradually declines southward. In the western portion of the belt the transition to the red hills is gradual. The country is very hilly and broken, with a height of from 100 to 150 feet above the streams, and is interspersed with deep gullies formed by the washing away of clays and sands.

The usual timber growth of these sand-hills is long and short-leaf pine, scrub black-jack, oak, sweet-gum, and some dogwood. Along the streams there is an undergrowth of bay and gallberry bushes, while their soil is but little less than sand, darkened more or less by decayed vegetation.

The lands of the sand-hills region have a soil of white sand from 6 to 12 inches deep, and usually a sandy subsoil underlaid by variegated clays, and are not very productive, except where fresh or highly fertilized. The yield after a few years' cultivation is only about 200 pounds of seed-cotton per acre, but on the best lands it is 300 pounds. A large proportion of the lands originally in cultivation now lies "out."

*Red Hills**.—The red-hills region is characterized by a high rolling or broken and well-timbered surface, covered with deep red clay lands, more or less sandy. The red lands are very generally associated with siliceous shell-rocks and friable ferruginous sand—

* *See Red Clay Lands, derived from marly deposits, shown on the Agricultural Map.

stones, and, as before stated, are found in isolated areas over the entire yellow-loam region. The beds have a thickness of 60 feet at Shell Bluff, on the Savannah river, and 50 feet at Fort Gaines, on the Chattahoochee, but between these two points they thin out to 10 or 20 feet as they approach the central Atlantic and Gulf water-divide.

Soils.—The lands of these red clay hills are usually somewhat sandy, and have a depth of from 12 to 24 inches in the eastern counties, and from 6 to 12 inches in others. The subsoil is a heavy clay loam, deeper in color than the soil and more clayey, which sometimes overlies a variegated and plastic pipe-clay. The growth is oak, hickory, short-leaf pine and dogwood, with beech, maple and poplar on the lowlands. The lands of the belt lying between the Savannah and Flint rivers are considered the best of the region, and not only occur in large areas, but are more productive and durable, and are easily tilled. The subsoil is stiff and tenacious, and hard to "break up." The lands yield from 800 to 1,000 pounds of seed-cotton when fresh, and 500 pounds after a few years' cultivation. Reports give the product after 50 years' cultivation as 300 pounds. These lands are, however, preferred for small grain.

The Oak, Hickory and Long-Leaf Pine Hills or Yellow-Loam Region.—This region forms a belt of country across the State between the Savannah and the Chattahoochee rivers, and extends in width from the sand hills south to the pine-barrens and wire-grass region. Its width varies greatly. Between the Savannah and the Ocmulgee it is narrow, and is confined almost entirely to the country south of the red hills, from 15 to 25 miles. Westward to the Flint river it is wider, and in Houston county the lands are found north of the red hills. On the west the area widens still more, one narrow belt extending southwest to Albany, while the lower limit of the rest of the region extends to the Alabama line a few miles north of Fort Gaines, and the northern passes west to the Alabama line at the mouth of Upatoi creek. The entire area embraced by the yellow-loam region, including the red hills, is about 6,650 square miles.

The soils of this eastern part of the belt are sandy and gray, except on the immediate surface, where they are dark from decayed

vegetation. Black, brown, and yellow ferruginous gravel is abundant in some of the counties on the surface and mixed with the soil. The subsoil, at a depth of from 3 to 9 inches from the surface, is either a yellow-clay loam or yellow sand. Lands having the latter are poor and unproductive, except perhaps for a year or two, and are only kept under cultivation with fertilizers. The growth is almost exclusively the long-leaf pine.

The better class of soils, with their clay subsoils and mixed growth of long-leaf pine, oak, and hickory, are easy to cultivate and are well drained, and yield an average of 500 pounds of seed-cotton per acre when fresh and 250 or 300 pounds after a cultivation of ten years.

West of Flint river these lands cover the greater part of the oak and hickory region. The upper counties, and those along the Chattahoochee river as far south as Clay county, are hilly, and are usually covered with a heavy deposit of sand. Underneath the sandy soil are the red and yellow clays over variegated and joint clays with Cretaceous marls. The growth of these hills is oak and hickory, with a large proportion of short and long-leaf pine, which also characterize these lands southward. Ferruginous sandstone is abundant in some localities on high points. These lands are but sparingly under tillage, owing to their broken character and to the abundance of good valley lands.

Southern Oak, Hickory and Pine Region.—The region embraced in this division comprises portions of the counties of Decatur, Thomas, and Brooks, lying along and near the Florida line. The country for the most part is high and rather rolling, and is about 75 feet above the open wire-grass country on the north or 130 feet above the river. In Decatur county it presents a bolder front to that region than in the other counties, the ascent along the line from a point 7 miles south of Bainbridge, thence eastward to near Attapulgus and northward by Climax, being quite abrupt. Eastward it gradually assumes the wire-grass feature, and the line of separation is not so well marked.

The area embraced in this southern region is estimated to be about 2,317 square miles. The surface of the country is for the most part very open, with a tall timber growth of long-leaf pine.

The soil is very generally sandy, from 6 to 12 inches deep, with mostly a clayey subsoil, underlaid by white limestone. A peculiar feature of the region is the presence of a red clay loam in small localities where the timber growth is oak and hickory. Wire-grass occurs but seldom in this region, and siliceous shell-rocks are almost entirely absent, except in some lowlands. The yield is reported to be from 600 to 800 pounds of seed-cotton per acre after four year's cultivation.

Lowlands of the Central Belt.—These comprise the bottoms and hummocks of the streams and gallberry flats. The bottoms of the larger streams are usually liable to yearly overflows, and are therefore but little in cultivation. Their width varies from 209 to 1,500 yards, and even more in the sharp bends of the streams. The growth is usually pine, oak, hickory, bay, poplar, maple, beech, gum, etc. The soil is a dark loam, more or less sandy, red in some of the streams, and from 1 foot to 6 feet deep to a tenacious pipe-clay.

On the Chattahoochee river there is but little bottom land proper, the uplands approaching to the water's edge and forming bluffs. As cotton crops on all of the bottom lands are liable to injury from early frosts and rust, corn and oats comprise the chief crops.

The gallberry flats are lowlands along the very small streams, which have a light sandy soil and a dense growth of gallberry bushes about 3 feet high and a larger growth of titi, cassino, small bays, and a few cypress. They are somewhat marshy, and are not under cultivation.

The hummocks, or second bottoms, of the larger streams above overflow are largely under cultivation, and on some of the streams are very extensive. They are very level, and have a growth similar to the bottoms. The soil is a rich sandy loam from 12 to 24 inches deep, with much decayed vegetation, and is considered the most productive of all the lands of the belt. An analysis of a hummock soil from Decatur county is given on page 43. Of seed-cotton these hummock soils yield about 1,400 pounds when fresh and from 800 to 1,000 pounds after being cultivated a few years. Heavy clays also underlie the lands. These lands are, however, not considered best for cotton, that crop being liable to injury from

early frosts and rust, though large crops are produced. They are said to be late, cold, and ill drained.

The alluvial lands of the Savannah river are very level and wide, and have a growth of beech, white and water oaks, hickory, ash, holly, bay, birch, walnut, mulberry, sycamore, and cottonwood. The soil, a fine brown loam mixed with scales of mica, is from 2 to 3 feet deep, with a putty-like, tenacious pipe-clay, which is hard to till and "breaks up in clods." These lands are largely under cultivation, being well adapted to cotton, corn, and grain, though the former suffers much from rust and early frosts. The yield in seed-cotton is about 1,500 pounds on fresh land and 1,000 pounds after a few years' cultivation, and unless prevented by having the rows far apart, or by other means, it grows to a height of 5 or 6 feet. Very little of this land lies out.

Along the Chattahoochee river, south from Columbus to Georgetown, there are many level valleys of open prairie occupying a position similar to the second bottoms of other streams, but higher, and without their growth. In Muscogee county these valleys are very broad and open, and have a fine sandy loam soil from 5 to 12 inches deep and a heavy clay subsoil.

In the counties south, where the blue-clay marls approach near the surface, these prairie valleys are richer, the soil being darker and more tenacious. The sand and red clays of the adjoining hills enter more or less into its composition. In the southwestern part of Stewart county this valley is two or more miles wide. The lands under cultivation yield from 800 to 1,200 pounds of seed-cotton per acre when fresh and from 600 to 800 pounds after five or ten years of constant tillage.

On the eastern side of the State, in Burke and Scriven counties, there are a number of ponds, some of them covering many acres each, which were once drained and brought into cultivation. The soil, while black from the long accumulation of decayed vegetation, was soon found to consist largely of a fine dust or silt, which, when dry, was very light. On being stirred up by plows or hoes this dust rose in the air, and by inhalation so irritated and injured the throats and lungs of the workmen that the fields had to be abandoned. This dust is derived from the siliceous and flinty rocks that

usually are found in heavy beds on the borders of these ponds. Examinations of these rocks with the microscope by Lyell revealed the presence of very minute siliceous sponge spicules, with sharp, needle-like points. The rocks, by their disintegration, have formed this fine and light dust, white, or sometimes red from the presence of a little iron, and it is these spicules which have done the injury to the workmen.

THE LONG-LEAF PINE AND WIRE GRASS REGION.*—This region covers a large portion of Southern Georgia south of the oak and hickory and pine lands of the central cotton belt, extending from the Savannah river on the east to the Chattahoochee river on the west, and including in its area eighteen whole counties and large parts of others. The entire region is, as it were, a vast plain very nearly level, except on the north, and covered with a growth of tall long-leaf pine.

The surface of the upper and western portions of this region is somewhat rolling or undulating, with a few low ridges or hills, and is elevated from 25 to 50, or even 75 feet, above the streams, and from 200 to 500 feet above the sea. This is especially the case in the northeastern and southwestern portions of the region, which also differs from the rest in being underlaid by limestone ("lime-sink region") and having a better class of soil, as indicated by the occasional admixture of oak and hickory with the long-leaf pine.

The differences in the two regions mentioned are sufficiently great to justify a subdivision into what may be termed the "pine barren" proper and the "lime-sink" divisions, the growth of long-leaf pine and wire-grass being still common to both. This entire wire-grass region is the special home of the gopher ("*testudo polyphemus*"), whose holes are marked by the innumerable small hills of sand seen everywhere.

The Lime-sink Region.—The lime-sink region lies chiefly on the west of the Atlantic and Gulf water-divide. The soft limestone underlying this section, instead of the sandstone alluded to, is accompanied on the surface, and sometimes in beds, by masses of a siliceous and aluminous and often flinty shell rock. The eastern limit

*The upper limits of the wire grass is shown on the agricultural map by a broken line.

of this lime-sink region is marked by a line of low ridges branching off southward from the main divide, and separating the waters of the Allapaha and Withlacoochee rivers from those of the Flint river. This line passes through the eastern side of Worth and Colquitt counties, and southeastward into Brooks and Lowndes. The region embraces about 7,020 square miles, and includes the following counties and parts of counties: Scriven, except a strip along the eastern and northern side of the county; the lower part of Burke; the upper part of Bulloch; all of Miller, Mitchell, Colquitt and Worth; the southern parts of Pulaski, Dougherty, Baker and Early; the northern parts of Decatur, Thomas, Brooks and Lowndes; the eastern parts of Dooly, Lee and Dougherty; and the western parts of Irwin, Berrien, Dodge and Wilcox.

This is a better cotton-producing region than the pine barrens, and Decatur county was at one time reported to be even the "banner cotton county" of the State in total production. It is said that 4 per cent of the land is irreclaimable swamp, and of the remainder over 26 per cent. has been cleared. Much of this is reported as now lying out, but 15.5 per cent. of the area is under cultivation, and of this 34.4 per cent is in cotton.

The uplands of the region, with their long-leaf pine and wire-grass, have a gray, sandy soil, which is from 6 to 12 inches deep, and a red or yellow sandy clay subsoil, and contain some ferruginous gravel. These lands are less under cultivation than the other varieties, as they are not as productive or as durable. They yield at first from 500 to 800 pounds of seed-cotton per acre, but after eight or ten years, without fertilizers, this is diminished to 350 or 500 pounds. The country is so sparsely settled that the farms are located chiefly on the better classes of land.

The *bottom lands* lying along the rivers and hummocks of the creeks have a dark loamy soil (alluvial), with a clay subsoil at a depth of from 10 to 20 inches. They are very durable, and yield from 800 to 1,000 pounds of seed-cotton per acre when fresh, and nearly the same after several years' cultivation. The growth on the streams is white and red oaks, ash, hickory, poplar, beech, bays and magnolia; on the uplands, along the large water-courses, oaks are a prominent growth.

Pine Barrens, or Sandy Wire-grass Region.—The division known as the *pine barrens* proper covers an area of over 10,000 square miles, and includes the following counties and parts of counties: Tattnall, Montgomery, Emanuel, Telfair, Appling, Coffee, the middle of Effingham, the southern portions of Bulloch, Johnson and Laurens, the eastern parts of Wilcox, Irwin, Berrien, and Lowndes, the upper portion of Pierce, Wayne, McIntosh, Liberty, and Bryan, and areas in Jefferson and Washington, Dodge, Ware, and Clinch, and is indicated on the map by a deep green color. It has a general level or slightly undulating surface, and is underlaid in many places by a sandstone, which juts out in bold bluffs on some of the streams. The soil is usually fine and sandy, with a yellow sandy subsoil, though clay frequently underlies it. The surface of the country in the upper counties is rolling or undulating, but becomes quite level southward, the soil also becomes less sandy. The land contains much ferruginous gravel or brown pebbles. The wire-grass region terminates near the coast, forming the second terrace. From this terrace there is a descent for 15 or 25 feet to the savannas and pine flat and palmetto lands.

This cannot properly be called a cotton-growing section of the State. Of the large area included in it, the estimate made by the Georgia Department of Agriculture is, that about 6 per cent. consists of irreclaimable swamp, and of the remainder only 15 per cent. has been cleared for cultivation. Returns show that of this a large percentage now lies out, and that but about 5 per cent. is under actual cultivation. About eighteen counties are devoted to cotton culture, lumber and turpentine interests, absorbing nearly the whole attention of its country people, especially near the navigable water-courses. The introduction of fertilizers in this section has made the cultivation of cotton profitable, and has broken up to some extent the old method of throwing away old land and taking in new.

The soil of the uplands is sandy and gray or ash-colored, 12 inches deep, and has a subsoil of yellow or orange-colored loam. In the higher regions there is sometimes a clay subsoil approaching the surface, giving to the land greater fertility and durability, as indicated by the oak and hickory growth. The soil is frequently covered with gravel, either of quartz or of ferruginous concretions, yellow or

of dark brown externally, and either smooth or rough, with a black interior. These latter are commonly known in some of the counties as the so-called "Georgia pills."

Both kinds are found in the upper portion of the region; but in the lower the ferruginous concretions only are observed, and then usually on the low hills. It has been noted that on lands containing these latter cotton is very liable to rust.

These sandy soils, while producing a very good crop of cotton when new and fresh, very soon wear out, and without the aid of fertilizers their cultivation is not profitable.

The yield in seed cotton on fresh sandy uplands without the aid of fertilizers is about 500 pounds per acre, though some correspondents report more than this. After cultivation for several years, this is diminished to about 300 pounds of seed cotton, or 100 pounds of lint, per acre. This, when sold, would bring only about \$10, with a clear profit of only from \$2 to \$4 at the estimated cost of production and marketing. Of other crops, corn and oats yield 10 bushels per acre, while sorghum cane does very well, and much attention is given to its cultivation.

The bottom lands in some counties are considered better than the uplands, but are more or less liable to overflow. In the northern section it is found that where cotton is cultivated it suffers from rust and is liable to be killed by early frost; hence corn is raised instead of cotton. The soil is very sandy, and is colored almost black by decayed leaves and other vegetation. Its depth is 12 inches or more, and it is sometimes underlaid by clay. The growth is poplar, cypress and titi, with some pine and "fever-tree," or "Georgia bark" (*Pinckneya pubens.*)

The second bottoms or hummock lands differ from the bottoms in being above overflow, but their other features are similar.

Pine and Palmetto Flats.—The region thus designated lies in the southeastern corner of the State, around Okefenokee swamp, and embraces mainly Charlton, Echols and Clinch counties, and large portions of Ware, Pierce and Wayne. It is considerably higher than the belt of the coast region that extends across other counties to the Savannah river, a dotted line through Glynn and Camden alone marking the line of separation between the two on the map. The country is very level and open, and sparsely settled, and is covered

with many swamps having a dense growth of titi, tupelo and black gums, sweet and loblolly bays, cassino, a short-leaf pine (*Pinus Elliotti*, or pitch pine of Mississippi), all interlocked and frequently tied together with bamboo briers, forming an impenetrable thicket. Long-leaf pine and cypress are the timber growth, and the open lands are often covered with a low and dense mass of saw-palmetto, gallberry bushes and some wire-grass.

This region is about 125 feet above the sea, the descent being very rapid on the east from Okefenokee swamp to Traders' Hill, at the head of the tide-water on Saint Mary's river. Thence there is a level second terrace to the edge of the savanna lands, 15 miles east of Colerain. This terrace is covered in places with deep, white sands, and is very similar to the third or Okefenokee upland.

In the entire section but little cotton is produced. The lands are sandy, though firm, and the roots of the saw palmetto (*Sabal serrulata*) not only make travel disagreeable, almost forbidding the use of four-wheel vehicles, but give trouble in farming operations. The lands wear out rapidly, and have not as yet been renovated with fertilizers, new and fresh tracts being inclosed and cultivated. In the swamps the white sandy bottoms are covered with a muck several inches deep, while streams of dark and even black water flow sluggishly among the roots and cypress knees and across open spaces.

The creek bottom lands and hummocks of this pine-flat region are not very wide, and have a dark loam soil from 8 to 12 inches deep, with a clayey subsoil underlaid by a blue clay stratum. This latter is found also in wells on the uplands north of Homerville, Clinch county, at a depth of 9 feet from the surface. These lands, while considered the best for cotton, have but a small area devoted to that crop. It is claimed that its late planting, and consequent late maturity, makes it liable to be killed by early frosts. The growth of these hummock lands is chiefly oak, black gum, maple, and tupelo-gum, cypress, etc.

COAST REGION.

The coast region embraces savannas, live-oak lands, and islands, covering in all about 2,045 square miles.

Savannas.—The region properly designated "*savannas*" occupies

a belt of country from 10 to 15 miles wide between the pine barrens and wire grass region on one side and the coast live-oak lands on the other, extends from the Savannah to the Saint Mary's river, and embraces nearly all of the counties of Chatham, Bryan, Glynn, and Camden, and large portions of Liberty and McIntosh. The surface of the country is very level and 10 or 15 feet above tide-water, and comprises what is known as the first terrace. Its north-western limit is the bluff of the second or wire-grass terrace, passing through the lower part of Effingham (20 miles north of Savannah) into Bryan, where it is 50 feet high. Southward through Liberty county this bluff forms "the gravel hill," south of Hinesville, which has an elevation of from 15 to 30 feet above the sea; deep sands are found here. Thence the limit extends through McIntosh county to Wayneville, and, on the eastern side of the Satilla river, into and across Camden county at a distance of about 15 miles east of Colerain. At this last point the rise is about 25 feet. Within this region, adjoining the marsh lands, there is a belt of live-oak land having a width of several miles which properly belongs to the savannas. This region along the first or lower terrace is noted for its beautiful meadow or savanna lands, which are broad, flat, and open plains, having no growth other than sparse and tall long-leaf pine and a thick undergrowth of saw-palmetto, with here and there bunches of wire-grass that has found its way down from the upper terrace. In the spring and early summer months these plains are covered with a dense growth of flowers, which give to them an enchanting appearance. The savannas at one time covered a large part of these counties, but the custom of burning off the lands to cause a growth of young grass for grazing purposes has also produced a scrub undergrowth of trees and bushes. The soils and subsoils outside of the live-oak lands are sandy and not much under cultivation. The streams are dark and sluggish.

Live-oak and Coast Lands.—Along the coast (as well as occupying the islands) from the Savannah river to Saint Mary's river there is an irregular and interrupted belt of yellow or mulatto sandy lands about 10 miles wide, whose characteristic feature is the growth of very large live-oak trees. From their widely-spreading branches

there hangs a very great profusion of "long moss" (*Tillandsia usneoides*), its long gray streamers reaching often as much as 10 or 15 feet toward the ground. Associated with the live-oak there is a growth of red and water oaks, hickory, chinquapin, pine, red cedar, sweet gum, cabbage palmetto (*Sabal palmetto*), sassafras, and a tall variety of blue palmetto (*Chamærops hystrix*). There are properly three divisions of this live-oak belt, viz. *upland or ridge, middle, and lower bottom* lands, each comprising about one-third of the area. The first has sandy soils and sub-soils, which are not considered as remunerative. The bottoms, on the other hand, are very rich, and have a dark soil underlaid by a blue clay.

These lands are well adapted to sea-island cotton, though but little attention is given to its cultivation. The yield is about 400 pounds of seed-cotton per acre.

The Coast Tide Swamp Land.—This occupies a narrow belt, not continuous along the Atlantic coast, but bordering on the various inlets and streams to the limits of tide-water. In White's *Statistics of Georgia* appears the following:

On the Savannah river the bodies of tide swamp land are extensive, and are cultivated upward of 20 miles from the brackish marsh up the river. On the Altamaha these lands equal in width those of the Savannah river, but from the marshes upward their extent does not exceed 16 miles, where the freshets forbid their being of any value except for timber. The soil has more of decayed vegetable mold than the land of the Savannah river, and is more easily cultivated. The tide lands of the Ogeechee extend from the marshes about 10 miles. Those of the Satilla, not as broad as those mentioned above, extend from the marshes 20 miles up the river, and are not liable to freshets.

On the Saint Mary's the swamp lands on the Georgia side extend only to the foot of the second terrace, some 15 miles east of Colerain, though tide-water reaches Traders' Hill. These are the rice lands of the State, being now almost exclusively devoted to its cultivation, though other crops do well. Black seed or Florida Sea-island cotton was once one of the principal crops of these low swamp lands.

The soil of the swamp lands along the streams and island is ash-colored and clayey, from 1 foot to 6 feet deep to a blue clay

stratum, The growth is cypress, water oak, gum, ash, maple, beech, and saw-palmetto.

Marsh Land.—There is very little of what may be properly termed sea marsh along the Georgia coast. Very small areas are found at the mouths of some of the rivers.

The Sea Islands.—Along the coast there lies from one end to the other a perfect net-work of islands, large and small, having a rolling surface, not exceeding 15 feet above tide. Their united areas amount to about 560 square miles. The growth is live oak, cedars, pines, and saw-palmetto, with some magnolia, gum, etc. The soil is usually sandy and well adapted to the production of sea-island cotton, corn and sweet potatoes. Lemons, figs, pomegranates, olives and oranges, grow finely. Cultivation of sea-island cotton has been nearly abandoned since 1861.

The cultivation of upland cotton (short staple) is now receiving more and more attention since the introduction of commercial fertilizers. Of sea-island cotton these soils formerly yielded from 400 to 500 pounds per acre in the seed when fresh and 300 pounds after the fourth year.

CHAPTER VII.

ECONOMIC MINERALS.

Under this head it is proposed to notice some of the more important and abundant minerals of the State that are susceptible of important uses.

The Mineral Map of the State, on a following page shows, with approximate correctness, the known localities of twenty varieties of minerals. There are doubtless other localities of equal importance with those given in which some of these may be found, and all that is claimed is a reasonable degree of accuracy consistent with the meagre available data for a map of this character.

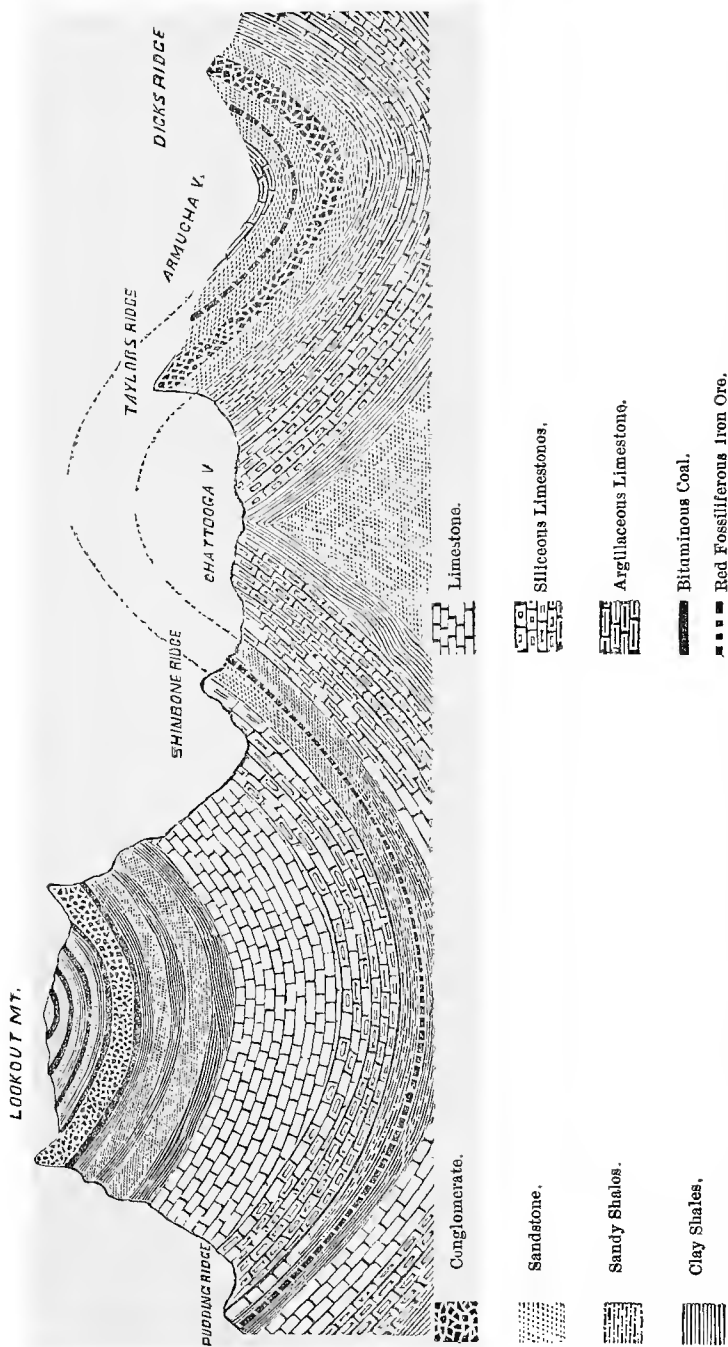
METALS AND ORES.

IRON ORES.

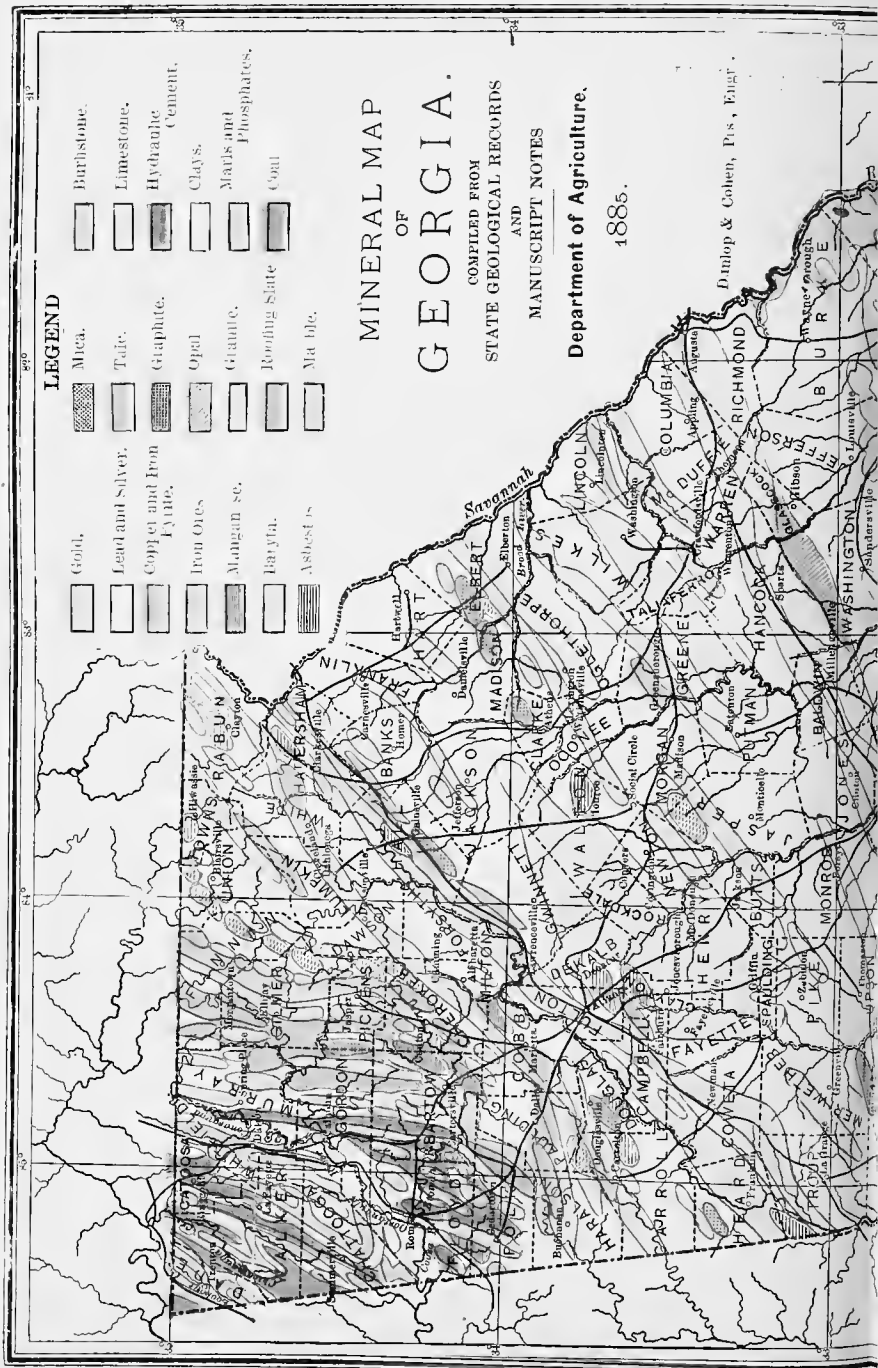
The Red Fossiliferous or Dystone Ore occurs in vast quantities, in beds, outcropping in sandstone ridges, that encircle the coal measures, or extend parallel with their eastern and western limits. There are from two to four beds of iron interstratified with shales or sandstone, the thickness of which varies from a few inches to 10 or 12 feet. This ore is found in the Pudding ridges of Dade county, in the Shinbone ridges of Dade, Walker and Chattooga, and in Taylor's ridge, and Dick's ridge in Catoosa, Walker and Chattooga. The ore bed is well exposed again on the top of Dirt Seller mountain, in Chattooga. The outcrop of the ore beds has a linear extent of one hundred and twenty miles, agreeing nearly with the Devonian formation in these counties, as shown on the Geological Map. The areal extent of country underlain by the beds is not less than 350 square miles, including only that portion of country bordered by outcropping beds that are believed to be of workable thickness.

The ore of Dade and the more westerly exposures in Walker contains a considerable percentage of lime. This cannot be considered as an impurity, as it scarcely anywhere exists in excess of what

is required for a flux. Around Pigeon Mountain, and especially on its eastern side, where the beds outcrop at high angles of dip, the lime is leached out leaving the ore somewhat soft and porous. This, like the ore of Dade and other portions of Walker, will be found to contain lime at a depth below the surface. In the more easterly beds, in Taylor's and Dick's ridges and in Dirt Seller Mountain, the ore is much more compact and heavy, though the beds appear not to have an equal thickness. The ore is fossiliferous, as in Pigeon and Lookout Mountains, and shows a similar lenticular or concretionary structure, but, unlike that, the lime of the shells has been entirely replaced with iron, and the ore is heavy and compact in comparison with the weathered beds farther west. The line of outcrop is shown on the map and its relation to the coal, limestones and sandstones by the section on the following page:



1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 84







The beds vary in thickness, and, in elevation above the valleys, and above the constant water level, as well as in other conditions, having relation to the practicabilities of development. Many of these are in close proximity to coal, and all to limestones and densely timbered areas. The ores themselves are practically inexhaustible. Only one analysis can be given as official. This is taken from the First Report of Progress of the Geological Survey of this State.

Fossil Iron Ore from Iron Ridge near Burnt Mill, in Walker county:

| | |
|-------------------------------------------|-----------------|
| Water and organic matter at red heat..... | 1.91 per cent. |
| Iron..... | 54.69 per cent. |
| Oxygen..... | 23.44 per cent. |
| Insoluble matter | 12.57 per cent. |
| Allumina..... | 7.42 per cent. |
| Phosphorus..... | .19 per cent. |
| Sulphur..... | a trace. |

100.22

The analysis shows less phosphorus than similar ores elsewhere are said to contain.

These ores have been worked at Rising Fawn, in Dade, and have been mined and shipped from Ringgold, in Catoosa.

Specular ore.—An ore of this class, known as gray iron ore, occurs in Bartow in some of the foot hills of the mountains, along the eastern side of the county. This is a granular or crystalline ore of steel-gray color, and occurs in stratified beds. A specular ore, with foliated structure, *micaceous iron*, is found associated with quartz in veins in the metamorphic along the Chattahoochee Ridge.

Limonite or Brown Iron Ores are found in large deposits, confined principally to a broad belt of country between Lookout and the Cohutta range of mountains.

Unlike the fossiliferous ores that exist in continuous strata, these are found in detached beds superimposed on the country rocks of nearly all geological ages.

The beds are more numerous and extensive east of the Chattoogata range. Most of these are confined to a series of cherty ridges previously described (see pages 88 and 96,) but some of the

most extensive beds are found in the Chattoogata range near Dalton, and at the line of Walker and Gordon in Snake Creek Gap, upper Silurian sandstone.

The most westerly occurrence of the beds are in the ridges passing east of LaFayette, in Walker. The ore in this range is found near Graysville, in Catoosa, also a few miles northeast from LaFayette, and again near South Carolina Camp ground, in Chattooga. The ores of this character, with the exceptions named, are to a great extent confined to the counties of Bartow, Floyd and Polk, where they exist in large deposits and have been extensively worked.

Extensive beds are found also along the Cohutta range, and in a belt of country east of this extending from Cherokee to Fannin, and in some localities much further southeast.

Magnetite.—This ore takes its name from the fact that it is attracted by the magnet. When it is endowed with polarity it constitutes the native magnet, known as lodestone. The ore is dark brown or iron black in color, and gives a black powder, and when pure it consists of iron 72.4, oxygen 27.6.

This is a most valuable ore, and is in great demand for the manufacture of steel.

Magnetic iron ores are found in many portions of the metamorphic formation, but principally in two belts extending across the State. One of these follows the western base of the Blue Ridge, and extends southwest from the terminous of the range to Carroll county, passing through Gilmer, Cherokee and Cobb. The other follows the Chattahoochee ridge for its whole extent.

The ore is found in scattered fragments over large scopes of country, and so abundantly in some sections, where no explorations have been made for the veins, as to lead to the conclusion that large undiscovered deposits may exist.

LEAD.

This metal is found in Georgia in the form of galena in a number of widely separated localities both in the metamorphic rocks of Middle and Northeast Georgia, and in the newer formations of

Northwest Georgia. The ore, when pure, contains in one hundred parts 86.6 of lead, and 13.4 of sulphur.

In Lincoln, at the Magruder mine, it is found associated with silver, copper and gold.

It is associated with gold near Gainesville, with silver and copper at the western base of the Cohutta, in Murray. This ore has been found in small quantities in a limestone bluff, on the side of the road that leads from Toccoa to Clarkesville, in Habersham. It occurs also in Union, Fannin, Floyd, Bartow and Catoosa. At Graysville, in Catoosa, a small vein is exposed by a cut on the Western & Atlantic Railroad. It is found again, in the county, five or six miles northeast from Ringgold, in a sandstone ridge. In Bartow, small quantities of this mineral are found with baryta.

COPPER.

Copper ores, in several varieties, are found in Union, Towns. Fannin, Cherokee, Paulding, Haralson, Carroll, Murray, Fulton, Lincoln and Greene. It occurs in the form of native or metallic copper, with ores of this metal at the Magruder mine in Lincoln,

The Fannin county veins are an extension of the celebrated Ducktown ores, and are considered equally rich in this metal. The veins can be traced for several miles, and have been worked to some extent near the northern line of the county.

A copper vein has been opened on the top of the Blue Ridge in Lumpkin. This can be traced for several miles northeast and southwest, following the trend of the mountain.

SILVER.

This mineral, though found in many localities associated with lead, copper and gold, does not appear as yet to have been discovered in sufficient quantity to be profitably mined. The most important localities of the known occurrence of the ore are in Lincoln, Hall and Murray counties. Galena nearly always holds some portion of silver, and sometimes the amount of this metal is sufficient to render the galena valuable as a silver ore. It is in this way, as argentiferous galena, that it has generally been found in this State. The principal localities are referred to in the mention of lead ores.

Traditions of Indian silver mines are common in the mountainous parts of the State, and much time and money have been expended in profitless search for such mines. The tribes of this State knew little or nothing of silver as a metal before the settlement of the country by Europeans, as evidenced in the fact that it is rarely if ever, found among the implements and trinkets buried with their dead.

An explanation of these traditions is suggested in the fact that the country, while in possession of the tribes, made a safe hiding place for counterfeiters. The Indians, not knowing the difference between silver and "pewter" may have been ignorant abettors in the work of counterfeiting, and were doubtless the safest medium for starting the circulation of such currency.

This much it is deemed proper to say in explanation of these traditions, so common in some sections, to prevent possibly thereby the misdirection of energy in pursuit of a popular *ignis fatuus*.

GOLD.

In nearly all portions of the metamorphic region of the State, where careful search has been made, gold, in greater or less quantity, has been found. It is known to exist, however, in paying quantities in certain strips or belts of country that extend with the general trend of the rocks, in a northeasterly and southwesterly direction. Two of these are continuous across the State, and others may be found to be so. One extends parallel with the Chattahoochee, from Habersham to Troup; the other in a belt reaching from Rabun to Carroll.

The gold fields north of the Chattahoochee were the first discovered, and have been the most extensively worked. The gold belts elsewhere in this State have been very imperfectly explored, and in extensive areas, in which this mineral may be expected to occur, it has not been looked for. Prospecting with pick, shovel and pan ceased, to a great extent, at the outset of the California gold excitement, and it is principally where gold was discovered and profitably mined by the pioneers with such rude appliances that more extensive mining operations are now conducted.

The gold schists dip at high angles, rarely less than 45° , and most commonly stand almost vertically. These rocks generally have undergone decomposition down to the constant water-level. The gold-bearing quartz lose their pyrite where exposed to atmospheric action, and to the depth to which this decomposition has gone, the ores are cavernous, and are mined with comparative ease, but below this they become hard and refractory.

The gold occurs usually in the quartz veins either as nuggets, or in fine gold disseminated through the pyrite, or with the residual iron oxide left by the decomposition of this mineral.

The auriferous rocks in different gold belts, and even in different portions of the same belt, vary greatly in character. This is true both of the schists and the quartz. The most general characteristic of gold-bearing quartz is that of its pyritous character. The pyrite may be disseminated in fine particles through the quartz or occur in large crystals, and the weathered quartz, in accordance with these conditions, will present either an iron-stained speckled surface, or contain large cavities from which this mineral has disappeared.

There are certain characteristic appearances by which the gold-bearing quartz of a locality may generally be recognized by the miner, but no single specific character, except that of the existence or non-existence of the gold, can be taken as a certain guide for all localities.

The first gold mining in Georgia was in the placer or alluvial deposits, where it is left by the streams which have washed it down the hill-sides from the original veins. This has been, as it is still likely to be for many years, the most profitable source of the mineral.

In the gold-bearing regions, as elsewhere in the State, the valleys have been brought to their present levels relatively to the mountains and hills principally by erosion. In this wearing down of the country by water currents, immense quantities of gold have been washed out and re-deposited at the bottom of the alluvial beds of the streams, or left behind elsewhere in the valleys or on the hill-sides. On many of the mountains near the larger streams

gravel beds are left at a distance from their present beds, and hundreds of feet above the valleys, marking the once higher levels of the water-courses. From the extent to which the strata has been worn away it becomes evident that more of the mineral is thus made available, by nature's sluicing, than is likely to be gotten in many ages by deep vein mining. These deposits of gold in Georgia have as yet scarcely been touched.

In the Report of the Director of the United States Mint for the year 1882, it is said: "The work of the year in Georgia was eminently successful in 1882, both in its steady prosecution and increase. New mines were selected with judgment, carefully equipped, and the work for the most part managed with prudence and economy.

The following is a summary of the report received of the production by counties:

| | Production. |
|-------------------------------------------------------------------------|-------------|
| Rabun..... | \$ 10,000 |
| White | 25,000 |
| Lumpkin..... | 225,000 |
| Dawson..... | 15,000 |
| Cherokee, Cobb, Paulding, Carroll, Towns, Union, Fannin,
Gilmer..... | 30,000 |
| Hall..... | 2,500 |
| Miscellaneous..... | 5,000 |
| Total.... | \$312,500" |

The reports were not all official, and the amounts in some cases are thought by the director to be overstated, and the total amount after careful review is placed at \$254,500. This shows an increase of \$120,500 over that of 1881.

The amounts reported will show, with close approximation, the relative production of the counties named.

MINERALS USED AS PIGMENTS.

OCRE.

The ocrees are similar in composition to the iron ores, but differ-

ent from them in consistency, being soft and pulverulent instead of forming compact masses.

The yellow ocre occurs in many parts of Northwest Georgia in association with the brown iron ores. A very fine quality is found at Stegall station in Bartow. It is found associated with baryta, on the bank of the Etowah river, near the railroad bridge. An ocre of a light yellow color is found in Washington county.

The red fossiliferous ores are often free of grit, and easily ground and will serve well for a paint material where a dark or reddish brown color is desired.

An earthy ocherous concretion is found in Southern Georgia in the small rounded pebbles that often cover the surface of the land, (see page 89). This concretion, as it occurs in some localities free from grit, may be utilized as an umber.

SULPHATE OF BARYTA.

This mineral is extensively employed as a pigment, both by itself and mixed with white lead, for which purpose it is well fitted by its great weight and by its whiteness when ground.

There are several beds of this mineral near Cartersville, and one east of Spring Place, in Murray.

COMBUSTIBLE MINERALS.

COAL.

The coal measures of Georgia, confined mostly to Dade, Walker and Chattooga, extend over an area of two hundred square miles, the distribution of which will be better understood by reference to the Mineral Map, than from descriptive details. The coals are bituminous.

At Cole City, in Dade county, coal has been extensively mined by the Cole City Mining Company. A narrow gauge railway has been constructed to the mines, which are here eight or nine hundred feet above the valley. The fine coal is coked at the mine, and the balance shipped and used for steam and grate purposes. Of the two principal beds worked at this place, that known as the

Castle Rock vein affords the hardest coal and best suited for burning in grates.

Five beds of coal are known to exist in Lookout Mountain. One of these is found below the heavy beds of sandstones and conglomerates that constitute the brow of the mountain. This bed has the greatest areal extent, but is of inferior quality at most places where it has been opened. Above this there are four beds exposed in and around Round Mountain—a horse-shoe shaped eminence of a few hundred feet on the top of Lookout.

The beds differ much in thickness, as do also each of them at the different localities at which they are exposed, varying from one to five feet. The beds of Round Mountain have been exposed by erosion. Rocky creek and the two prongs of Bear creek have their origin near this mountain, and have cut their way in deep gorges through the sandstones and conglomerates. For nearly twenty miles south of Round Mountain, the sandstones and shales that form this eminence are spread out in a nearly level plain, and probably contain the beds of coal, though not exposed. In Chattooga county some of the beds are exposed near Little river.

The section on a preceding page shows the relation of these beds to the red iron ores, limestones and sandstone.

Lignite.—This name is applied to an inferior coal of a brown color that retains often the structure of the original wood. It has been found in small quantities near the upper limits of the tertiary formation in this State.

MINERALS USED IN CHEMICAL MANUFACTURES.

PYRITE.

This, when pure, contains in 100 parts 46.7 of iron and 53.3 of sulphur. It is now extensively employed in the manufacture of sulphuric acid. It is also employed in the manufacture of copperas or sulphate of iron.

It is found in vast quantities in this State. A great number of veins were opened in searching for copper before the late war. Most of the shafts sunk for this purpose exposed the iron pyrite, with a small per cent. only of copper. Considerable de-

posits are found in Carroll, Paulding, Haralson, Cherokee, Fannin and Fulton.

The mineral is now worked near Dallas in Paulding, and the ore shipped to Atlanta for the manufacture of sulphuric acid. Dr. J. L. Rogers says of the mine: "The vein averages five or six feet and improves in size and in quality of ore with the increased depth, and yields 40 to 42 per cent. of sulphur and five per cent. of copper (though at first only 1.2 per cent.) with some silver and a very small per cent. of gold."

MANGANESE.

Important mines of binoxide of manganese are found near Cartersville, in Bartow.

The ore is now mined and shipped to England, where large quantities are used for bleaching purposes. Another most important application of the ore is found in the manufacture of speigle iron, used in making steel.

The ore is found in a number of localities in the State, but principally along or near the line of the silurian and metamorphic. The largest deposits appear to be along the eastern side of Bartow. It is found also in Polk and Floyd. It occurs in these counties in the form of nodular concretions and in detrital deposits of more recent origin than that of the other formations of this section.

The mineral is also found in vein, in the older or metamorphic rocks, but as yet it is not known in large deposits of this character.

MAGNESIA.

Dolomite, a variety of limestone, containing when pure, in 100 parts, about 40 parts of carbonate of magnesia, is found in vast quantities in ten counties of northwest Georgia, and the native carbonate or magnesite may yet be found here. These minerals are used for the manufacture of magnesia and its salts, which are extensively used in pharmacy.

Another source of supply for magnesia exists in serpentine, which is found in Towns and in other localities in the range of this county.

MINERALS USED IN AGRICULTURE.

PHOSPHATE OF LIME.

The increasing demand for phosphate as fertilizers gives special importance to all minerals of this class.

Phosphatic nodules or fossil bones, composed of phosphate of lime, have been found near the coast. No large deposits are known to exist in Georgia, but from the similarity of the geological formations of the coast region with that of the celebrated phosphate deposits of South Carolina, it is reasonably inferred that future search may disclose the existence of such deposits. In the cretaceous and tertiary marl beds are sometimes found fossil bones containing phosphorus. Some of the marls are also found to contain a small per cent. of phosphate.

Apatite.—A crystalline phosphate of lime, though not known to occur in the State, is found associated with metamorphic rocks, such as cover a large part of Middle and Northeast Georgia.

GYPSUM.

Gypsum, which is a sulphate of lime, when ground makes the land plaster used as a fertilizer. It is also used in the arts as a cement and stucco.

The mineral is found in the tertiary formation in Georgia.

In Wilson's cave, in Walker county, it occurs as an incrustation on some of the limestones and in efflorescent crystals on the floor of the cave. Whether or not it exists in workable quantity in the State is not at present known.

MARLS.

(See *Marls and Peats* on a subsequent page of this chapter.)

REFRACTORY MATERIALS, AND MATERIALS SUITABLE FOR BRICKS, POTTERY, GLASS AND OTHER PURPOSES IN THE ARTS.

GRAPHITE.

Graphite, or plumbago, which is commonly known as black lead, has a number of applications in the arts. The finer varieties are employed in the manufacture of pencils, and command a high price. The inferior qualities are used to impart lustre to iron, and are in general use for this purpose as a stove polish, and also in considerable quantities as a lubricant for machinery. Another important application is in the manufacture of crucibles and melting pots used in metallurgy.

In Elbert county there is a mine of graphite that has been worked to some extent. This is the largest deposit of this mineral that has been opened. It is also said to be found in the same belt of country in Madison and Clarke counties. Graphite in small pockets has been found at the base of the itacolumite, about the county line of Pickens and Gordon, and an impure variety in Hall, Douglas and Bartow, as well as in many other localities in North Georgia, that will serve as a stove polish and as a lubricant.

The beds underlying the itacolumite are more or less graphite and this may be referred to as probable horizon of the mineral in working quantity.

MICA.

This mineral occurs in large masses or crystals in some granite veins along with quartz and feldspar. The mineral, as is well known, cleaves into thin transparent plates, which have various applications in the arts. It is employed for fronts of stoves, for lanterns and lamp chimneys, and large sheets, not being subject to break from concussion, are used instead of glass on vessels of war.

The value of mica depends upon the size of the sheets and their freedom from flaws or discoloration. The large sizes are most in demand and bring the highest prices, but a ready sale is found for mica that will cut one and a half by two inches, and even the scraps and refuse of the works have a market value.

Mica, in masses of large sizes, have been found in most or all the places indicated by the mineral map, and to this the reader is referred for the principally known localities in which it has been found.

TALC.

This is a soft mineral, easily ground, and finds an important, legitimate use in the arts as a refractory material for lining furnaces, for jets, for gas-burners; as a lubricator to reduce friction in machinery; for white crayons and for a variety of purposes to which a soft mineral, easily shaped, or one that will stand the heat of a furnace or the action of acids, may be applied. A beau-

tiful light green tale is mined in Murray county, near Spring Place. A white tale is found along the marble lead that extends from Fannin to Cherokee. A gray variety is worked in Cherokee.

In boring for water in Atlanta, a small fragment of tale was brought up by the pump from the depth of 170 feet. The thickness of the bed could not be ascertained, as all except a single fragment was ground to powder by the drill and intimately mixed with other material.

SOAPSTONE.

This name is applied indiscriminately to several varieties of mineral in this State. Among these are an impure variety of tale, to which the name more properly applies, and a compact chlorite to which has also been given the common name of potstone from its use as a material for pots. Fragments of vessels, showing this use of the material by the Indians, are of common occurrence in Middle and North Georgia. There is another common variety—a radiated asbestos, found in extensive beds in Middle Georgia, to which this name is given.

ASBESTOS.

This mineral has several important uses as a fire-proof material. It has been made into cloth, as is generally well known, and is used as a fire-proof packing for safes. Of late years it is in considerable demand for the manufacture of a fire-proof paint. It exists in many localities in the State, and such of these as are known are shown on the map, and need not be further referred to.

SANDSTONE AND SAND.

These materials are used for the construction of furnaces, for moulding sands for foundries, for the manufacture of glass, and for ordinary building purposes. Sandstones are found in great variety in Northwest Georgia, and loose sand from the wearing down of siliceous rocks is abundant in all parts of the State.

CLAYS.

Materials suitable for brick are found in all parts of the State, and require no special mention.

A fine pottery clay occurs in extensive beds in the counties situated immediately south of the metamorphic portion of the State.

This is worked at Stevens' Pottery, in Baldwin county, for firebrick and tile. The clay is white, quite soft, and free from grit or other impurities.

In reply to inquiries relative to the thickness of the beds at Stevens' Pottery, the proprietors say: "Our clay bed covers a good many acres of land and varies in thickness from four to ten feet. We have one bed of pure fire clay, two of pipe clay. One of these is something like putty; the other has not so much tenacity; it has never been analyzed. We manufacture sewer pipe, land tile, flower pots, jugs, and most everything made of clay."

Kaolin, generally associated with large mica crystals and sometimes with merchantable mica, exists in many localities in the central and northern part of the State.

Another variety of clay, known as halloysite, has been found in Dade, Chattooga and Whitfield. The Devonian group, to which this belongs, exists also in the counties of Walker, Catoosa, Gordon and Floyd, where also possibly this mineral may be found upon search. The geographical position of the outcrop of the group may be seen by reference to the geological map of the State.

This clay has been tested for pottery with the best results, and has been shipped from Dade county and used in the manufacture of alum, for which it has a special adaptation.

An analysis of a Dade specimen given in Dana's Mineralogy shows silica, 40.4; alumina, 37.8; magnesia, 0.5; water, 21.8.

BUILDING STONES.

Although Georgia possesses, in great abundance, every kind of stone required, both for common and decorative purposes, but little has been done to bring these materials into notice.

From what has been said under the head of General Geology of the State, it is apparent that granite and gneiss are common rocks throughout the middle and northeastern parts of the State, and limestones and sandstones in the northwestern part. With the exception of the granite and roofing slates, the building materials, until recently, have been almost entirely neglected.

Granite has been worked at Stone Mountain, roofing slate at Rockmart, and since the construction of the Marietta and North Georgia Railroad marble quarries have been opened on that line of road.

It is proposed to notice some of the more important materials of this class and more particularly to call attention to the localities where the different varieties may be found in the State.

GRANITES, SYENITES AND GNEISSES.

True granites and syenites are intrusive rocks, and are generally restricted to narrow limits, but there are extensive beds of stratified rocks that have the same composition and uses, and can only be distinguished by traces of stratified structure. These are sometimes distinguished as gneisoid granites. The larger part of the granites of the State are of this character.

A gray granite of excellent character as a building material is found near the Chattahoochee river in its course across the State. This appears at intervals in the northeastern part of the State and spreads out over a large area south of Atlanta.

This is a fine-grained feldspathic granite, speckled with a black mica. The shades or depths of color vary with the proportion of quartz feldspar and mica that enter into the composition of the rock. This variety is worked at Stone Mountain.

Syenite.—A granite of very dark shade of color, is found in Elbert and Oglethorpe, and may extend to the southwest of these counties. This variety is largely composed of hornblende, to which the dark or almost black appearance of the stone is due. It has not been worked, but would probably make a good building material.

Near the southern limits of the metamorphic rocks there are two varieties, a gray granite, similar in appearance to that of Stone Mountain and a flesh-colored variety. The latter contains a pink colored feldspar that gives this peculiar color to the stone. The flesh-colored granite extends in an almost unbroken line across the State, from Richmond and Columbia to Muscogee.

MARBLES.

The name of marble is applied to limestones which, from their susceptibility of polish, or from their firmness of texture and color, are suited for decorative purposes or for sculpture. The exact composition of the stone is not an essential character; it may be either a pure carbonate of lime or a magnesian limestone.

An important marble belt extends through the counties of Cherokee, Pickens, Gilmer and Fannin, containing a white statuary mar-

ble and several variegated kinds, some of which are unique in color and remarkably beautiful. This is now quarried in Pickens by the Georgia Marble Company, and by the Perseverance Mining Company.

A bed of crystalline limestone extends from Habersham along the western face of the Chattahoochee Ridge, through Hall and Gwinnett passing near Atlanta. This bed was reached in boring for artesian water in Atlanta at the depth of seventeen hundred and fifty-one feet.* The bed has been found to vary much in appearance at different places of outcrop, and may be found to have the requisites of a good marble in some localities.

Variegated marbles in many varieties are found in the counties of Polk, Floyd, Whitfield, Catoosa, Chattooga, Gordon, Murray, Bartow and Walker. The Tennessee variety of red variegated marbles exist in vast quantities in the county of Whitfield. In Red Clay valley it occurs in a bed of uninterrupted continuity ten miles in length and from one-fourth to half a mile in width. It is found also in Dalton, and outcrops at many places along the Chattoogata mountains, both in this and some adjoining counties.

There is a compact limestone, with calcite veins, found extensively in Polk, Floyd, Gordon and Bartow, that presents, when polished, the beautiful effect of a network of white lines on a dark blue or black ground.

Compact, colored and variegated marbles abound near Rockmart, in Polk. Among the kinds are black, white, cream, flesh and dove colors, with others in which some of these shades are intermingled.

LIMESTONES.

All of the Lower Silurian and sub-carboniferous groups abound in limestone, the distribution of which has been mentioned in treating of the geology on previous pages. The situation of some of the more important limestone are also shown on the Mineral Map. The varieties are too numerous to admit of special mention in the space allotted to this subject. Among them there are many beds of hard, compact limestones and others that are granular or oolitic and comparatively easily worked. The Knox Dolomite group

* The drill, as this goes to press, has passed through 83 feet of limestone, and has gone 16 feet into a siliceous bed below it.

abound in granular or crystalline magnesian limestone that are easily worked. The Knox shale and upper sub-carboniferous contain oolitic beds, well suited for building material.

SANDSTONES.

These have been mentioned among refractory materials, but some localities containing sandstones, especially suited for building uses, deserve further notice.

The Chattoogata mountains contain sandstones of various shades of color, among which are white, gray, buff, brown and red. Some of these exist in massive compact beds, while others have a jointed structure that make them easily quarried. The thickness of the entire series of sandstone is about eight hundred feet. Building stones of this character may be had also on Lookout and Sand mountains, and in the Cohutta range.

FLAG STONES.

Many of the stratified beds in Middle and North Georgia contain thin layers well suited for sidewalks and street crossings.

The banded gneiss, found so abundantly along the southeast slope of the Chattahoochee Ridge, has been much used on the streets of Atlanta, and is well suited for this purpose.

In Dade, Walker and Chattooga excellent flagging stones occur about the base of the coal measures. The rock is a compact sandstone of great strength, with a smooth cleavage corresponding to the bedding. The only uses yet made of the stone is for hearths for fire-places. Slabs can be obtained from the quarries of any desired size or thickness. The bed is often covered by *debris* from overlying rocks, but is well exposed in the Lookout Gulf, near Trenton, in Dade, and at Eagle Cliff and Pigeon Mountain, in Walker.

Hard sandstones, that cleave readily into thin slabs, are found in the Cohutta range, in the eastern parts of the counties of Murray, Gordon and Bartow.

SLATES.

The important requisites for a good roofing slate are durability and the capacity of splitting readily and evenly into thin plates. The fine grained varieties are used for writing slates, and the softer kinds for pencils.

Cleavable slates are found in great quantities along or near the line of contact between the silurian and metamorphic groups, near the Cohutta, Silicoa, Pine Log and Dug Down mountains.

The most noted locality in which roofing slates are found in the State is on the eastern side of Polk county. The slates outcrop in steep hills, apparently in beds of great thickness, and have been extensively worked at Rockmart. These slates are of a dark color, approaching closely to black. Dark colored slates are found also in Bartow, Gordon, Murray and Fannin counties. Slates of buff and light green shades are found in large quantities in the north-western portion of Bartow.

MATERIALS FOR CEMENTS AND MORTARS.

LIMESTONES.

The lower silurian and the carboniferous limestones of Northwest Georgia constitute altogether a thickness of more than two thousand feet, and outcrop over a large extent of country.

Many of these limestones are remarkably pure carbonate of lime, while others have a greater or less degree of impurity. The sub-carboniferous beds contain the purest limestones. These are over four hundred feet in thickness, and are found in Dade, Walker, Chattooga, Gordon and Catoosa.

Indurated marls or limestones, suitable for lime, are found in great abundance in Southern Georgia.

A bed belonging to the dolomite group is worked at Graysville, in Catoosa. The proprietors, Messrs. C. W. Gray & Co., say:

"There are three different qualities of limestone: one is almost a pure carbonate, analyzing about 95.50 per cent. carbonate of lime; one is a dolomite, analyzing about 45 per cent. of magnesia and 50 of carbonate of lime, while the other makes a very quick setting and hard mortar and a cement or hydraulic lime."

The lime manufactured at this quarry is of superior quality.

Two qualities of lime are manufactured at Ladd's Lime Works at Cartersville. One of these is an almost pure carbonate of lime from stalactitic calcite, and the other a dolomite of excellent quality for mechanical purposes.

HYDRAULIC CEMENT.

The Knox dolomite group contains many beds of limestone suited for the manufacture of this material.

A hydraulic cement of excellent quality is made at Cement, in Bartow, from a bed of these limestones, known as Howard's Hydraulic Cement. Mr. Geo. H. Warring, who has charge of these works, says: "The ledge of rock is 45 feet thick, dipping at an angle of 45 deg. The supply of rock is inexhaustible. The mill has a grinding capacity of 30 barrels per hour." This is said to be the only quarry of hydraulic cement south of Louisville, Ky., and Richmond, Va. The cement is believed to have special value in resisting the deteriorating influences of the atmosphere, and may be kept for a long time without injury. It sets more slowly than some other cements, but from this cause becomes permanently harder.

GRINDING AND POLISHING MATERIALS.

MILLSTONE.

Buhrstone.—This important material is found over a large section of Southern Georgia, extending from the counties of Burke and Scriven to the southwestern corner of the State. The principal localities, however, in which the beds have much thickness are on the eastern side of the State.

Most of the buhrstones used in this country have been imported from France, and that found in Georgia has been pronounced by experts as in all particulars equal to the best quality of French buhr. It exists in large quantities along and near the Savannah river, and at other points convenient for transportation. The stone varies from a light gray to a reddish or brown color, and abounds in cavities, which are generally lined with chalcedony and afford some beautiful specimens of this mineral. The rock does not appear to exist as a continuous stratum, but occurs in association with the marl beds, of which it appears to be solificied portions, in certain restricted areas, sometimes replacing the marl in the entire thickness of the bed. The localities of occurrence will be understood by reference to the mineral map.

Brecciated Conglomerate.—A hard brecciated stone is found in Chattooga county that has been used in the surrounding country for corner-stones. The analysis shows of insoluble siliceous matter 97.72 per cent. and soluble in strong acid, silica 2.15, oxide of iron 0.15. The small proportion of soluble matter and the hardness of the material suggest an important use for grinding phosphate rocks by the acid process.

The *Ocoee conglomerate*, found in the Cohutta range of mountains and the *millstone grit* of Lookout and Pigeon Mountains, afford also good millstones.

WHETSTONES AND GRINDSTONES.

The most important whetstone grit known in the State is the nanvaculite, of Lincoln county. This is found in immense beds near Grave's Mountain. The itacolumite or flexible sandstone in some localities affords a suitable material, both for whetstones and grindstones, as do also some of the sandstones of Taylor's Ridge and of Chattoogata and Lookout Mountains.

CORUNDUM.

Corundum has been found in Union, Towns, Rabun, Carroll, Douglas, Dawson, Hall and Habersham counties. Near Hiwassee, in Towns county, small ruby crystals have been found. The mineral at this locality is mostly either of a light straw or gray color, but some has been found of a beautiful sapphire blue and of light rose red. In Rabun county an extensive deposit of corundum of a light gray color has been worked.

TRIPOLI.

A tripoli, or rotten stone, of excellent quality as a polishing material is abundant near Dalton, and is found also in many other localities in this part of the State.

OTHER MINERALS FOUND IN GEORGIA.

LITHOGRAPHIC STONE.

For the purpose of lithography, a fine grained and compact limestone is required. A bed having these requisites is found at the base of the Trenton group, in Walker and Catoosa counties. The

stone is of a light dove color, with a smooth conchoidal fracture, like that of flint. There are at this horizon several beds of this rock, alternating with dolomite, that may be readily distinguished from the layers, with which they are associated by the remarkably even and smooth weathered surface of the stone. The beds appear to vary from two or three to ten feet in thickness.

DIAMONDS.

A few diamonds have been found in this State along with the gold-bearing rocks. These have been discovered in most instances in washing for gold, and as yet no systematic search has been made for this gem. The first Georgia diamond is said to have been found in 1843, by Dr. M. F. Stevenson, ~~at the ford of Brindletown creek~~, in Hall county. It was an octohedron, and valued at about one hundred dollars. Since that time others have been found in this State and in the adjoining States of North Carolina and South Carolina.

There are many accounts of diamonds lost through ignorance of their value, or the treachery of dealers, upon which no reliance can be placed. There are, however, well authenticated discoveries of the diamond in Hall, Lumpkin, White and Dawson.

The itacolumite group, bearing a striking analogy to the strata of the diamond-bearing districts of Brazil, Africa and Australia, is found in different portions of the State. The group consists of the itacolumite, proper, or flexible sandstone, with underlying graphitic schists and limestone, (see pages 79 and 80). The itacolumite has been regarded as the matrix of the diamond, and though nothing is absolutely known of the original home or stratigraphic position of the diamond, as they have been found only in detrital deposits, the graphite, another form of carbon found here, is suggestive of some close relation in origin.

OPAL.

This mineral occurs in some of the clay beds of Southern Georgia. A noted locality is in the upper portion of Washington county, where a variety is found approaching that of fire opal in appearance. It is also found further south in the county of Bullock.

Among other minerals found in Georgia in greater or less amounts, not mentioned on the preceding pages, may be named, platinum,

arsenic, antimony, sulphur, bismuth, zinc, tin, garnet, tourmaline, epidote, cyanite, staurolite, glauconite, serpentine, calcite and lazulite, rutile.

MINERAL WATERS.

It is well known that all springs contain in solution minerals derived from the strata through which the waters flow, but such only as contain some mineral sufficiently in excess to give distinctive character are usually called mineral waters. These contain a great number of substances, some of which, either from their slight solubility or rare existence in the strata, are found only in minute quantities. Lime, soda, potash, magnesia, alumina, iron, manganese, boron, iodine, bromine, arsenic, lithium, fluorine, barium, copper, zinc, strontium, silica, phosphorus, with the gases, carbonic acid, hydro-sulphuric acid, oxygen, nitrogen, hydrogen and ammonia are found in various combinations. The most important of these minerals, in a therapeutic point of view, are believed to be sodium, magnesia, iron, carbonic acid and sulphur.

Mineral waters are found throughout the State, and exist in great numbers along the outcropping of certain geological groups. In the northwestern part of the State, such springs are most abundant in the Carboniferous and along the outcropping of the Devonian strata. In the middle and northeastern parts they abound most near the outcroppings of the itacolomite group. (See page 79.) Wells affording mineral waters are of frequent occurrence in Southern Georgia.

MARLS AND PEATS.

The following report on marls was prepared for the Geological Survey of the State, by Prof. H. C. White, and is now reprinted from the Hand-Book of Georgia:

(A) MARLS.—Strictly speaking, the term “marl” should perhaps be only applied to such masses or deposits of earth as are calcareous in nature. In general use, however, it has come to have a much more extensive application, and to include within its meaning earthy pulverulent masses of various sorts and compositions, many of which contain little or no lime. The necessity has therefore arisen for the classification of marl deposits, and for the qualification of

the term by prefixed names, in the order of adjectives, generally suggested by and distinguishing some characteristic or peculiar property of the deposit. Thus, the "green-sand marls" of New Jersey are masses of loose, pulverulent earth, distinguished by the presence of numerous small particles of what appears to be *green sand*, the composition of which is chiefly silicate of iron and potash. Many of these "marls" contain very little lime. Clay marls contain much clay; siliceous or sandy marls much sand. In either of these cases, the second prominent constituent should be carbonate of lime; sometimes, however, these names are applied to deposits which contain little or none of this last-named substance. "Shell marl" is a true marl, and has been formed by the disintegration and comminution of the larger shells from which it was derived.

It is but proper to say that the ultimate origin of *all* true calcareous marls was, perhaps, the shells or other secretions of marine animals. In "shell marl," these shells are comparatively very large, are generally discernible to the eye in some part of the mass, and consequently leave no doubt as to the origin in this case. Frequently, however, during the disintegration or breaking up of the shells, the finely divided portion has become mixed with clay, sand and other matters, so that the material does not retain the composition of the pure shell. Very often, also, the disintegration of the shell is by no means complete, so that large fragments, and even entire shells, remain mixed with the mass.

The specimens of marls examined, and which represent perhaps the general character of much the larger part of the great marl deposits of Georgia, belong, with few exceptions, to the class of shell marls.

The peculiar properties and composition of marl render it a material capable of useful application in several industrial pursuits; but the one great industry in which it has, up to this time, mainly found application, and been esteemed valuable in the use, is agriculture. In treating of the uses and value of marl, therefore, we would naturally be led chiefly to consider its relations to fertility, and those of its properties which fit it for the use of the husbandman.

As an inspection will show, the analyses given herewith exhibit

a great uniformity in the qualitative character of the specimens examined. The main differences indicated are in the relative *proportion* of the constituent substances. Of the substances named in the analyses, those which mainly give to the marls their agricultural value are lime, magnesia, and phosphoric acid, to which may perhaps be added, as possessing some value, soluble silica and organic matter.

(a) *Lime*.—The value of lime as a fertilizing agent, especially efficacious in the restoration of worn-out lands to a condition of fertility, has been known for many years, and its use in this connection dates far back into antiquity. The main sources of the lime used in agriculture are, and have always been, limestones, marl and marine shells, not yet broken up and aggregated even to the condition of marl. Limestone differs from marl, in that the former is generally more or less compact and hard; while the latter, even when exceedingly rich in lime, is generally pulverulent, crumbly and soft. Limestone or shells are rarely ever used in their original, natural forms; generally they are burned in kilns, which effect, a radical change in their composition and properties.

As is well known, the lime in limestone (and in shells also) is combined with carbonic acid, forming carbonate of lime. On burning, the carbonic acid is driven away in the form of gas, and the lime is left behind. This "burnt lime" differs essentially from the carbonate of lime from which it was derived. The hard and compact limestone is changed to a loose, friable, and soft mass of lime. The mild, inactive limestone is transformed by the loss of its carbonic acid to "caustic" or "quick" lime, which must be handled with care lest it burn the flesh, and which exhibits a most powerful tendency to combine with water; so strong is this attraction, that when quicklime is slaked by treatment with water, a great heat is developed by the energy of the combination, which manifests itself in the bubbling and steaming of the mass.

Moreover, caustic lime, if exposed, will attract to itself water from its surroundings, as the air (when it becomes "airslaked" lime) or the soil upon which it may be applied. But water is not the only substance with which caustic lime exhibits a tendency to unite. It is what in chemical language is termed a strong *base*—i.e., it has a great disposition to combine with acids; and even though the acid be already united to other bases, it

will frequently replace the latter by the superior strength of its attraction. The slaking of lime—either by the addition of water or exposure to air—while it diminishes its *causticity* and *quickness*, does not impair its basicity; on the contrary, it may be said to increase it. Slaked lime therefore possesses the power of attracting to itself and uniting with acids.

It is usually in the caustic or slaked form that our agriculturists have been accustomed to apply lime to their soils in order to increase fertility. A knowledge of those proprieties discussed above may help us to understand something of its action in this connection. The action had by lime when applied to soils, as generally ascribed, may be briefly enumerated as follows:

1. Lime is a necessary article of food for all plants. Soils deficient in lime will, therefore, not produce good crops. Analysis shows also that it is one of the substances required in largest quantity by most plants for food. Continued cultivation would, therefore, exhaust a soil of its lime more quickly than of many other constituents.

2. Lime, by reason of its basicity, attacks and decomposes certain mineral salts in the soils, uniting with the acids and liberating the bases. Chief among the salts so decomposed are certain alkaline silicates—compounds of silicic acid with potash, etc.—which are, in themselves, not in a condition to be assimilated by plants, but which, when decomposed, yield potash (especially) and other substances in an assimilable form, which are important articles of plant-food. The application of lime, therefore, to soils which contain such unavailable silicates (and nearly all soils do contain them in considerable quantity) is indirectly the application to the crop of available food from the soil, of which it otherwise would not have the advantage.

It may be noted that the soil would of itself, in course of time, present this food to the plant, since the disintegration and decomposition of the refractory silicates would in time be effected by weather and other natural agencies. The lime merely does in one season what the ordinary course of nature would require years to perform. It has, therefore, in some localities, come to be a proverb (based, it may be said, upon an experience which a proper forethought and a knowledge of the natural principles involved would

have rendered less disastrous than it has many times unfortunately been) that "the use of lime enriches the fathers and impoverishes the sons"—meaning that the drain made upon the soil by the forcing of its stored-up plant-food into a condition at once ready to be taken up and appropriated by the growing crops, tends to exhaust the land in a few years of all its power to produce and support vegetation ; and so it does.

If the application of lime alone, lavishly, indiscriminately, and without knowledge and understanding of its action, its value, and danger, were all the farmer did to keep his land, then the truth of the proverb would be very soon attested.

We take it that the agriculturist is perfectly justifiable in seeking to obtain as large a yield for any given crop as his land will possibly afford. Indeed, it would seem that the true idea of agriculture should be to make the comparatively small portion of the soil that is concerned in plant-feeding do as much and as active service as possible. If all can be made available in one season, and the crop be proportionately increased, so much the better is it for the farmer ; and he is not only justified in his prosperity, but is worthy of commendation for cleverly and wisely taking advantage of the best service which nature and his land can render him. He is a thrifty, shrewd, and successful agriculturist who keeps his capital—*i.e.*, the plant-food of his soil—in-active circulation.

Of a certainty—if this were all—the soil, thus deprived of its plant-feeding substance, would become worn out and barren ; but so it would, in course of time, if no forced production were had, and there were taken each season, only just so much as the soil, under its natural condition, was pleased to give. The difference is only one of time. In the latter case, the land, after yielding small—probably unremunerative—crops for several—10, 20, perhaps 30—years, would then fail to produce. In the former, abundant remunerative yields for two, three, or four seasons effect the same result.

Judged of from this consideration alone, it would appear that the more speedily the lands were rendered barren, the better. But it is well known that there is a remedy by which the barrenness incident to the continued gathering of small crops may be prevented,

and that, by proper treatment, any given soil may be retained indefinitely in a condition of normal fertility. What is true of ordinary cropping applies with equal truth to extraordinary yields.

The Golden Rule of Agriculture, the prescriptive antidote to exhaustion, of universal application—whether the yield from the soil be great or small, whether it be normal or abnormal, natural or forced, is this: Return to the soil each season as much plant-food as the previous crop carried away. The value of this rule is universally acknowledged, and its teaching followed in cases of ordinary production. It is equally applicable in cases of excessive yield induced by the use of lime. Where the yield is small, the matter returned to the soil need be but small; where the yield is large, the return must be correspondingly great.

Nor need it be feared that the increased return made necessary will tax heavily the profits of the large yield. A moment's consideration only is necessary to show that the valuable portion of the crop—that for which the crop was raised—whether the grain of the cereals or the lint of the cotton—constitutes, generally, but a small portion of the total vegetation produced. Only this portion—that which is desired for sale or consumption—should be removed from the soil. All else should be at once returned; and the drain upon the soil—small, even with large crops thus legitimately made—can certainly, in these days of Charleston Phosphates and German Potash Salts (not to mention numerous commercial fertilizers of various names and grades), be readily and cheaply compensated.

The farmer is therefore wise in stimulating production from his land by the use of lime, and his wisdom will lead him to retain unimpaired the productiveness of his land, by repaying the liberality of its increased yields by equally liberal applications of the elements of fertility. So, when properly studied and understood, it would appear that the observed facts which gave rise to the proverb quoted, are but testimony to the value of lime, when properly applied, as an agent in increasing the fertility of the soil.

3. Lime expedites and powerfully aids the decomposition of organic matter, of which all soils contain a greater or less propor

tion, probably through its great attraction for the carbonic and other acids formed during this process. In this respect, it is held by some that the action of lime is rather injurious than of advantage to the average soil. Whenever the organic matters are of a highly nitrogenous character, this is doubtless true; whether it is so in other cases may perhaps be doubted. It is certain that lime renders a portion of the organic matter soluble, and thereby improves its character; the service thus rendered would, perhaps, at least counterbalance the ill effects of destruction of a part of the organic matter.

4. By reason of its attraction for water, lime tends to abstract moisture from the soil to which it is applied. This action can, perhaps, hardly be put down to its credit, unless, indeed, in the case of soils containing an undue amount of water, the removal of which would go to their improvement. The evil, however, can in great part be corrected by the thorough slaking of the lime before application.

5. There are several minor actions of lime upon the soil which need not here be discussed at length. It is supposed, for instance, to increase the power of the soil to absorb ammonia from the atmosphere, though its value perhaps in this respect is but slight. Again, it sometimes happens that certain soils are barren because of the presence of certain substances, such as protosulphate of iron (copperas), which are poisons to plants. The application of lime will correct this poisonous character and restore fertility to the soil.

It would appear, from the forgoing discussion, that the claim of lime to rank high in value as an economical agricultural agent is well sustained and must be considered beyond doubt.

It remains to be determined how far the marls, such as those, the analyses of which will be given in this paper, are capable of replacing the burnt lime of ordinary use, and to what extent their actions and values differ.

In marls, as in the original unburnt limestones, the lime is combined with carbonic acid, forming carbonate of lime. Marls, therefore, lack the basicity and causticity of burnt lime, and, so

far as the value of the latter depends upon these properties, it cannot be fully replaced by the former. Carbonic acid, however—although caustic and slaked lime have for it a great attraction—is an acid that can be driven from its combination with comparative ease. The carbonate of lime is, therefore, in some respects, not wholly without the properties of caustic lime. It possesses these, however, in a much less intense and active form. Thus the application of carbonate of lime to the soil would, in course of time, effect the disintegration and decomposition of unavailable silicates in much the same manner as caustic lime would act in the same connection. The action would, however, be much slower, and would require a much greater length of time. The tendency on the part of marl, therefore, to exhaust the soil by stimulating increased production would be much less rapidly exerted.

So far as the furnishing of lime as an article of food to plants is concerned, the marl is of equal value with the caustic lime. The lime is, perhaps, as available in one case as the other, or, at least, speedily becomes so. Marl has not the attraction for water that caustic lime possesses, and hence has no tendency to deprive the soil of its moisture. The available property possessed by slaked lime of improving the physical condition of the soil, by lightening it, rendering it porous and open to the effects of the air and rains, is shared to almost an equal extent by marl.

We may therefore conclude that it is perhaps doubtful if all the advantages to be derived from the use of caustic or burnt lime can be had by the use in its stead of marl; but that all the dangers which are incident to its application can be avoided is certain.

It may be well to note the fact that burnt or slaked lime, on exposure or on application to land, does not long retain its caustic character, but by absorbing carbonic acid from the air, it rapidly passes to the condition again of carbonate of lime. A consideration of this noteworthy fact has, indeed, led some to conclude that the increased value of burnt lime over limestone was not due entirely to the causticity of the former, but, in considerable part, to the fact, that as a result of the burning, compact limestone was

reduced to a loose, pulverulent, finely divided condition, better suited to act upon the soil. In other words, that the difference in action between limestone and burnt lime, applied to the soil, is more *physical* than *chemical*.

It has accordingly been suggested that limestone finely powdered by mechanical means would possess much of the value of burnt lime.

Experiments made in accordance with this suggestion have, we believe, been attended with good results. The value which theoretical considerations of its composition and properties have assigned to marl as a fertilizing agent is well attested by the results of practical experiments. Wherever it has been employed, the increased fertility of the land has been well marked, and excellent results have been obtained.

The use of marl is not of recent introduction. Its value has been for many years recognized and turned to good account. Shell-marl especially is perhaps at this time more generally used, and in larger quantities, for agricultural purposes in England and Europe, than any other one article employed for fertilization. The causticity of burnt lime and its tendency to disorganize matter render caution in its use necessary, since a great excess might even attack and "burn up" the growing crop. With marl, mild and harmless, no such danger need be apprehended, if judiciously applied.

The amount used in practice varies very much. In different localities, from 10 to as much as 200 or 300 bushels per acre have been applied with profit, and on soils abundantly supplied with vegetable matter; but the quantity depends upon the condition of the soil and the quality of the marl. The character of the soil and various economical considerations must guide the farmer in his estimate of the amount he may with propriety employ.

In this State, marl has not yet come into general use; it has found local application only, but always with good results. We are not at this time in possession of statistics to the extent to which it is dug and used. No doubt when the true value of the great marl-beds within the borders of the State are properly understood,

they will be more generously estimated as sources of agricultural wealth.

(b) *Magnesia*.—The action of Magnesia in the soil is very similar to that of lime. It possesses much of the value, but when present in large excess has more than all the danger of common lime. When such excess is present, its effect is more injurious than valuable. We need not now detail the reasons for this action; hence certain magnesian limestones produce burnt lime which is not suitable for agricultural purposes. The amount found in the marls examined is so small that it adds somewhat to, while it detracts nothing from, their value as fertilizers.

(c) *Phosphoric Acid*.—This is the article of plant-food which, perhaps above all others, should claim the farmer's most careful attention. It is absolutely necessary to the life and growth of plants; it is appropriated by them in large quantities, and is unfortunately furnished by the average soil in very small proportion. The soil is therefore very speedily exhausted of its supply, and it behooves the farmer to carefully and continually return phosphoric acid to his soil, lest it become barren through dearth of this ingredient. Phosphoric acid, in one form or another, is therefore made the basis of all good commercial fertilizers.

Marls generally contain a small proportion of phosphoric acid, and their value is much enhanced thereby; so much so, indeed, that the comparative value of two marls may be said to be in direct ratio to their proportion of phosphoric acid. The importance of the matter is such that the estimation of the phosphoric acid alone in the various marls of Georgia is a work that would be well worthy the attention of the State.

(d) *Soluble Silica and Organic Matter* add something perhaps, to the value of marls, when present. In the specimens examined, the quantities of both are so small that they perhaps influence their action to a very slight degree only.

We present the analyses of the samples of marls examined:

No. 1. From Washington County, two miles north of No. 13, Central Railroad: of nearly pure white appearance, coarsely granular, friable and dry.

| | | | |
|-----------------------|--------|---------------------|---------|
| Lime..... | 49.872 | Oxide of iron..... | 1.654 |
| Magnesia..... | 0.120 | Alumina..... | 0.406 |
| Carbonic acid..... | 39.215 | Organic matter..... | a trace |
| Phosphoric acid..... | 0.782 | Water..... | 1.628 |
| Silica (soluble)..... | 0.984 | | |
| Sand..... | 5.320 | Total..... | 99.981 |

No. 2. From Sapp's Mill, Big Spring, Burke County: of light yellowish brown color, containing clay; sandy texture, friable, and pulverulent.

| | | | |
|-----------------------|--------|---------------------|---------|
| Lime..... | 47.231 | Oxide of iron..... | 2.140 |
| Magnesia..... | 0.082 | Alumina..... | 1.450 |
| Carbonic acid..... | 36.979 | Organic matter..... | a trace |
| Phosphoric acid..... | 0.251 | Water..... | 1.784 |
| Silica (soluble)..... | 0.128 | | |
| Sand..... | 9.680 | Total..... | 99.725 |

No 3. From Effingham County, Mrs. Longstreet's: a mass of coarsely comminuted shells mixed with sand, pebbles, etc; fragmental, and of dark brown color.

| | | | |
|-----------------------|---------|---------------------|--------|
| Lime..... | 15.948 | Oxide of iron..... | 2.380 |
| Magnesia..... | a trace | Alumina..... | 1.354 |
| Carbonic acid..... | 12.452 | Organic matter..... | 0.256 |
| Phosphoric acid..... | 0.075 | Water..... | 1.168 |
| Silica (soluble)..... | 0.612 | | |
| Sand..... | 65.620 | Total..... | 99.865 |

No. 4. From Crockett's Spring, Scriven County: pure white; rather compact; of very fine granular structure; crushing readily to impalpable powder.

| | | | |
|-----------------------|--------|---------------------|--------|
| Lime..... | 50.136 | Oxide of iron..... | 1.241 |
| Magnesia..... | 0.025 | Alumina..... | 0.215 |
| Carbonic acid..... | 39.451 | Organic matter..... | 0.124 |
| Phosphoric acid..... | 0.045 | Water..... | 1.026 |
| Silica (soluble)..... | 1.106 | | |
| Sand..... | 6.628 | Total..... | 99.997 |

No. 5. From Reddick Quarry, Scriven County: nearly pure white; coarsely granular and friable, showing fragments and impressions of shell; very dry.

| | | | |
|-----------------------|--------|---------------------|---------|
| Lime..... | 50.136 | Oxide of iron..... | 3.218 |
| Magnesia..... | 0.054 | Alumina..... | 0.549 |
| Carbonic acid..... | 37.054 | Organic matter..... | 0.658 |
| Phosphoric acid..... | 0.132 | Water..... | 1.231 |
| Silica (soluble)..... | 1.582 | | |
| Sand..... | 7.321 | Total..... | 100.120 |

No. 6. From Burke County, Shell Bluff: of faint brownish tinge; otherwise similar to preceding.

| | | | |
|-----------------------|--------|---------------------|---------|
| Lime..... | 46.763 | Oxide of iron..... | 4.310 |
| Magnesia..... | 0.046 | Alumina..... | 0.621 |
| Carbonic acid..... | 36.521 | Organic matter..... | 0.752 |
| Phosphoric acid..... | 0.125 | Water..... | 1.314 |
| Silica (soluble)..... | 1.216 | | |
| Sand..... | 8.412 | Total..... | 100.080 |

No. 7. From Clay County Narrows, Pataula Creek: dark, bluish gray color; hence sometimes called "Blue Marl; a friable mass of shells and calcareous fragments, mixed with fine, dark-colored earth; micaceous, the small particles of mica giving it a glistening appearance; slightly acid in reaction, hence dangerous to use alone; should be mixed with small amount of caustic lime or purer marl before application.

| | | | |
|-----------------------|--------|------------------------------|---------|
| Lime..... | 4.891 | Alumina..... | 2.142 |
| Magnesia..... | 0.158 | Potash and Soda..... | 0.146 |
| Carbonic acid..... | 3.740 | Organic matter..... | 7.312 |
| Phosphoric acid..... | 0.315 | Water..... | 2.450 |
| Sulphuric acid..... | 0.543 | | |
| Silica (soluble)..... | 2.213 | Total..... | 100.130 |
| Sand..... | 71.112 | Nitrogen (yielded by organic | |
| Oxide of iron..... | 5.108 | matter)..... | 0.058 |

No. 8. Clay County, above Brown's Mill, north of Fort Gaines: coarsely broken shells mixed with earthy and organic matter of a dark color; fragmentary and friable.

| | | | |
|-----------------------|--------|-----------------------------------|--------|
| Lime..... | 19.002 | Alumina..... | 1.106 |
| Magnesia..... | 0.025 | Organic matter..... | 2.563 |
| Carbonic acid..... | 15.040 | Water..... | 1.572 |
| Phosphoric acid..... | 0.021 | | |
| Silica (soluble)..... | 0.823 | Total..... | 99.884 |
| Sand..... | 57.320 | Nitrogen (in organic matter)..... | 0.013 |
| Oxide of iron..... | 2.412 | | |

No. 9. From Clay County, Fort Gaines, Chattahoochee River: light yellowish tinge (nearly white), coarsely granular and friable; forms and impressions of small shells and fragments distinctly visible.

| | | | |
|-----------------------|---------|---------------------|--------|
| Lime..... | 44.942 | Oxide of iron..... | 3.186 |
| Magnesia..... | a trace | Alumina..... | 2.450 |
| Carbonic acid..... | 35.216 | Organic matter..... | 1.306 |
| Phosphoric acid..... | 0.019 | Water..... | 1.328 |
| Silica (soluble)..... | 1.016 | | |
| Sand..... | 10.462 | Total..... | 99.925 |

No. 10. From Chattahoochee County, Bagby's Mill: in general appearance and properties very similar to No. 7.

| | | | |
|-----------------------|--------|----------------------|---------|
| Lime..... | 5.551 | Alumina..... | 2.321 |
| Magnesia..... | 0.162 | Potash and soda..... | 0.158 |
| Carbonic acid..... | 4.362 | Organic matter..... | 8.121 |
| Phosphoric acid..... | 0.231 | Water..... | 2.560 |
| Sulphuric acid..... | 0.430 | | |
| Silica (soluble)..... | 0.312 | Total..... | 100.109 |
| Sand..... | 70.919 | | |
| Oxide of iron..... | 4.982 | Nitrogen..... | 0.037 |

No. 11. A fossiliferous joint clay from Smith's Summit R. R. cut, ten miles northeast of Macon, Jones County: a clay containing fragments of shells.

| | | | |
|-----------------------|---------|---------------------|---------|
| Lime..... | 10.128 | Alumina..... | 14.321 |
| Carbonic acid..... | 7.264 | Organic matter..... | 0.131 |
| Phosphoric acid..... | a trace | Water..... | 5.616 |
| Silica (soluble)..... | 2.320 | | |
| Sand..... | 57.021 | Total..... | 100.085 |
| Oxide of iron..... | 3.284 | | |

No. 12. From Quitman County, near Hatchy's Station: a blue marl of light bluish gray color, coarsely granular and friable; contains sand and pebbles; slightly acid reaction.

| | | | |
|-----------------------|---------|----------------------|---------|
| Lime..... | 7.740 | Alumina..... | 1.541 |
| Magnesia..... | a trace | Potash and soda..... | 0.108 |
| Carbonic acid..... | 6.081 | Organic matter..... | 5.352 |
| Phosphoric acid..... | 0.121 | Water..... | 2.421 |
| Sulphuric acid..... | 0.312 | | |
| Silica (soluble)..... | 0.123 | Total..... | 100.090 |
| Sand..... | 72.191 | | |
| Oxide of iron..... | 4.106 | Nitrogen..... | 0.020 |

No. 13. From plantation of J. S. Odom, Montezuma, Macon County, Ga.: a light colored, friable, coarsely granular shell marl.

| | | | |
|-----------------------|--------|---------------------|--------|
| Lime..... | 43.672 | Oxide of iron..... | 3.025 |
| Magnesia..... | 0.035 | Alumina..... | 1.756 |
| Carbonic acid..... | 34.122 | Organic matter..... | 2.105 |
| Phosphoric acid..... | 0.028 | Water..... | 1.450 |
| Silica (soluble)..... | 1.215 | | |
| Sand..... | 12.642 | Total..... | 99.952 |

No. 14. From same locality as No. 13: a light yellow, loose, pulverulent marl.

| | | | |
|-----------------------|--------|---------------------|---------|
| Lime..... | 46.212 | Oxide of iron..... | 2.420 |
| Magnesia | 0.108 | Alumina..... | 2.586 |
| Carbonic acid..... | 34.731 | Organic matter..... | 0.291 |
| Phosphoric acid..... | 0.875 | Water..... | 2.105 |
| Silica (soluble)..... | 0.140 | | |
| Sand | 10.532 | Total..... | 100.000 |

Nos. 15, 16 and 17. Three samples of light, buff-colored shell marl from Houston county.

| | 15. | 16. | 17. |
|-----------------------|---------|---------|---------|
| Lime..... | 45.384 | 46.732 | 45.654 |
| Magnesia | 0.213 | 0.098 | 0.075 |
| Carbonic Acid..... | 34.986 | 35.431 | 34.874 |
| Phosphoric Acid..... | 0.758 | 0.894 | 1.012 |
| Silica (soluble)..... | 0.354 | 0.218 | 0.314 |
| Sand..... | 13.451 | 11.963 | 13.551 |
| Oxide of Iron..... | 2.105 | 2.346 | 2.082 |
| Alumina | 1.354 | 0.987 | 1.114 |
| Organic Matter..... | 0.075 | 0.113 | 0.130 |
| Water | 1.320 | 1.218 | 1.194 |
| | <hr/> | <hr/> | <hr/> |
| | 100.000 | 100.000 | 100.000 |

No. 18. From the neighborhood of Albany, Dougherty county: dark-colored, loose, and pulverulent; contains an unusual amount of phosphoric acid, no doubt associated with a local deposit—perhaps recent—of animal bones.

| | | | |
|-----------------------|--------|---------------------|---------|
| Lime | 42.876 | Oxide of Iron..... | 2.654 |
| Magnesia..... | 0.145 | Alumina..... | 1.328 |
| Carbonic Acid..... | 31.958 | Organic Matter..... | 2.394 |
| Phosphoric Acid..... | 2.574 | Water | 1.628 |
| Silica (soluble)..... | 0.435 | | |
| Sand..... | 14.008 | Total | 100.000 |

While a perfect acquaintance with the character and true agricultural value of the vast marl deposits found within the borders of the State is to be had only after careful and extended examination (involving searching and critical analyses), the above stated results and remarks will perhaps serve to clearly indicate that such examination is well worthy the attention of the State, and that the labor thus bestowed, it might confidently be expected, would be productive of interesting and valuable results.

(B) PEATS.—Peat is an accumulation of organic, with a varying proportion of earthy matter, that is found in swamps and marshes, or in localities where the land was at one time of a marshy character. Its production is the result of the partial decomposition and

decay of leaves, twigs, and other vegetable bodies. To it are closely allied, in character and composition, such substances as muck, bog-earth, swamp-mud, etc. In peat, the decay of the organic matter has stopped short of total decomposition. It is therefore largely carbonaceous, and is consequently generally of a black or dark brown color. Peat has hitherto found, in general, but two useful applications—viz., as a fuel and as a fertilizer.

The specimens thus far found in this State, of which analyses are to be herein given, possess very little value as fuel, because of the small proportion of organic matter; their fertilizing properties are, however, probably of considerable importance. As the analyses indicate, they contain a considerable proportion of mineral matter such as is valuable to plants for food. There can, perhaps, be no question that the association of this mineral matter with the organic matter of the peat improves its condition to a considerable degree, and renders it more assimilable to plants than it otherwise would be. In order to estimate the extent of this improvement, it will be observed that experiments have been made (the results of which are hereafter recorded) to determine the solubility of the specimens and their constituents in a dilute solution of ammonium carbonate, which may be taken to represent the natural solvent of the soil through the agency of which plants receive their food. These experiments were, in fact, the application of the Grandeau process of soil analysis to the samples of peat examined.

Peat is rarely, perhaps never, used alone in its application to land. It is generally composted with other substances, which greatly improve its character. The best substances for composting with peat are caustic lime, or lime that has been slaked by a strong solution of common salt in water. We have no doubt that many of our ordinary marls could be substituted for lime with good effects. Peat in its natural condition contains more or less nitrogen—a valuable fertilizing element—which it yields to the soil. Composting with burnt lime causes the escape and loss of this element. It is probable that the use of marl would not be attended with this disadvantage. There are doubtless a great number of deposits of peat, muck, etc., in the State, many of which would be found very useful for agricultural purposes. Opportunity has not yet been presented

however, for a full and careful examination of these, so as to present at this time a complete report upon their character and value. This will no doubt form a part of the valuable and interesting work the Geological Survey has yet to perform.

We present the analyses of the samples examined:

No. 1. From Muscogee county, eight miles northeast of Columbus; found at a depth of three feet below the surface; of a light gray color; heavy, dry and friable; specific gravity, 1.963.

| | | | |
|----------------------|--------|-----------------------|--------|
| Water..... | 6.115 | Carbonic Acid..... | 0.587 |
| Organic Matter..... | 16.314 | Oxide of Iron..... | 4.145 |
| Lime..... | 0.652 | Alumina..... | 3.420 |
| Magnesia..... | 0.134 | Silica (soluble)..... | 2.592 |
| Potash..... | 0.055 | Sand..... | 63.359 |
| Soda..... | 0.020 | | |
| Phosphoric Acid..... | 0.245 | | |
| Sulphuric Acid..... | 0.218 | Total..... | 99.850 |

Treated with a dilute solution of ammonium carbonate, the following were extracted from the peat:

| | | | |
|---------------------|-------|------------------------------|--------|
| Organic Matter..... | 6.223 | Phosphoric Acid..... | 0.136 |
| Lime..... | 0.247 | Silica, Iron Oxide, etc..... | 5.274 |
| Magnesia..... | 0.091 | | |
| Alkalies..... | 0.042 | Total..... | 12.013 |

No. 2. From same locality; on the surface, in bed or layer 18 inches deep; of dark gray color; rather compact, but friable; specific gravity, 1.195.

| | | | |
|----------------------|--------|-----------------------|---------|
| Water..... | 7.340 | Carbonic Acid..... | 0.432 |
| Organic Matter..... | 21.531 | Oxide of Iron..... | 3.847 |
| Lime | 0.923 | Alumina..... | 1.642 |
| Magnesia..... | 0.152 | Silica (soluble)..... | 7.431 |
| Potash..... | 0.086 | Sand..... | 46.383 |
| Soda..... | 0.018 | | |
| Phosphoric Acid..... | 0.218 | | |
| Sulphuric Acid..... | 0.117 | Total..... | 100.120 |

Treatment with ammonium carbonate extracted the following:

| | | | |
|---------------------|-------|----------------------|--------|
| Organic Matter..... | 7.658 | Phosphoric Acid..... | 0.125 |
| Lime..... | 0.352 | Silica, etc..... | 10.132 |
| Magnesia..... | 0.065 | | |
| Alkalies..... | 0.054 | Total..... | 18.386 |

No. 3. From same locality; found on the surface in bed 18 inches deep; of black color; spongy and compact; specific gravity, 1.537.

| | | | |
|----------------------|--------|-----------------------|--------|
| Water..... | 8.512 | Carbonic Acid..... | 0.675 |
| Organic Matter..... | 30.808 | Oxide of Iron..... | 2.563 |
| Lime..... | 0.920 | Alumina..... | 0.874 |
| Magnesia..... | 0.111 | Silica (soluble)..... | 3.216 |
| Potash..... | 0.105 | Sand..... | 51.472 |
| Soda..... | 0.017 | | |
| Phosphoric Acid..... | 0.239 | | |
| Sulphuric Acid..... | 0.214 | Total..... | 99.729 |

Treatment with ammonium carbonate extracts the following :

| | | | |
|---------------------|--------|----------------------|--------|
| Organic Matter..... | 12.563 | Phosphoric Acid..... | 0.141 |
| Lime..... | 0.415 | Silica..... | 6.452 |
| Magnesia..... | 0.027 | | |
| Alkalies..... | 0.075 | Total..... | 19.673 |

No. 4. Dougherty county, vicinity of Albany ; a black muck from a cypress swamp ; spongy, light, and of black color.

| | | | |
|----------------------|--------|-----------------------|---------|
| Water..... | 11.321 | Carbonic Acid..... | 0.914 |
| Organic Matter..... | 22.450 | Oxide of Iron..... | 3.224 |
| Lime..... | 1.312 | Alumina | 2.415 |
| Magnesia..... | 0.129 | Silica (soluble)..... | 4.621 |
| Potash and Soda..... | 0.152 | Sand..... | 53.115 |
| Phosphoric Acid..... | 0.241 | | |
| Sulphuric Acid..... | 0.166 | Total..... | 100.000 |

This specimen was not treated with ammonium carbonate.

Analysis of a specimen of "clay slate" from Col. Seaborn Jones' land, Rockmart, Polk county, of a red color ; said to be used to some extent as a paint.

| | | | |
|--------------------|--------|-------------|---------|
| Water..... | 14.973 | Silica..... | 43.325 |
| Oxide of Iron..... | 11.321 | | |
| Alumina..... | 30.381 | Total..... | 100.000 |

CHAPTER VIII.

WATER POWERS.*

THE CHATTAHOOCHEE RIVER

rises in the mountains of Northeastern Georgia, and, after traversing the State in a southwest direction to West Point, takes a course nearly due south, and for three hundred miles, by river measurement, forms the boundary between Georgia and Alabama. It then enters West Florida, and flowing across that State empties into the Gulf of Mexico. From the seaboard to Columbus, a distance computed by water at four hundred miles, there is constant navigation for boats carrying 750 bales of cotton, and this portion is being improved by the removal of bars and other obstructions. The river passes through the following counties in Florida, viz.: Franklin, Liberty, Calhoun, Gadsden and Jackson. It also flows along the following counties in Alabama: Henry, Barbour, Russell and Chambers, and seven counties in Southwest Georgia, which comprise one of the finest cotton-growing sections in these States. There are fifteen counties in Georgia contiguous to that portion upon which the great water-powers are found. These counties had in 1880 a population of 255,259. Their real estate and personal property were valued at \$53,042,645, while the annual product of farms was \$10,537,966. These figures are taken from the United States Census of that date, and according to the same authority they had 782 factories and work shops of all descriptions. These employed a capital estimated at \$8,269,544, their annual product being valued at \$12,238,518.

Comprised in the above are fourteen cotton mills, running 125,629 spindles and 3,430 looms, 4 woolen factories with 53 sets cards

* This chapter, except as otherwise credited, was prepared by Col. B. W. Frohel, C. E., late of the U. S. Engineer Corps.

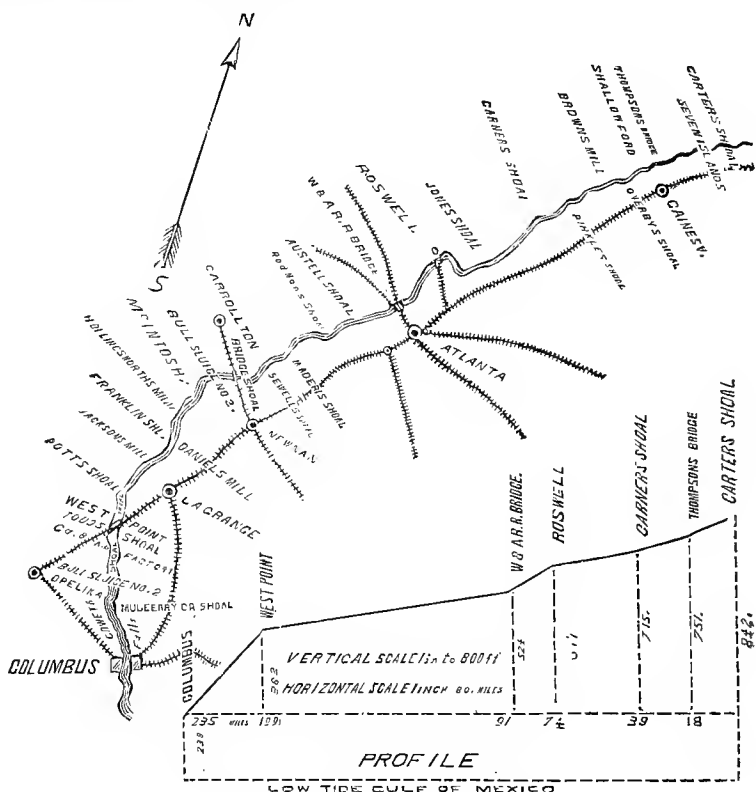
and 200 looms, besides 234 flour and grist mills, 80 saw mills, 4 paper mills, 7 foundries and machine shops, 5 furniture factories and 21 tanneries. Most of these are situated immediately upon the Chattahoochee and its tributaries. The great gold region of Georgia also lies upon the waters of this stream, and there are besides rich beds of magnetic iron ore and other minerals. From Lula to West Point a continuous line of railroad runs nearly parallel with the river, at no point more than seven miles distant from it, while in many places it approaches within half a mile. Railroads also cross it at the following points: Near Gainesville, near Roswell, near Atlanta, near Newnan, at West Point, at Columbus and Eu-
faula. Being fed by living streams, many of which have their head-springs in the mountains of Northern Georgia, the Chattahoochee is not subject to the extreme fluctuations which impair the value of many other streams as water-powers. It is neither frozen up in winter nor dried up in summer, and at all times has an abundant flow of water. For convenience the survey is divided into three sections. The first embraces that portion from Thompson's bridge to the W. & A. R. R. bridge.

SECTION 1.

This section is 73 miles long, the initial point at Thompson's bridge being 989.02 feet above mean low tide in the Gulf of Mexico. At the W. & A. R. R. crossing the elevation is 762 feet above tide, giving a fall of 227.02 feet in the distance named. Along this entire section the regimen of the river is fixed, the bottom and banks being uniformly of rock, and with an average width at the water surface of about 300 feet. Twenty-one shoals are found here, with an aggregate fall of about 160 feet. Between these shoals the current is usually gentle, with long stretches of unobstructed water sufficiently deep for the passage of boats whose draft does not exceed three feet. For the building of mills and dams an abundance of stone and timber may be had at all points close at hand.
From

Thompson's Bridge to Shallow Ford is about three miles. The river here is 200 feet wide and from four to eight feet deep at low water. The shoal begins a short distance above the ford and is

5,500 feet long with 6.71 feet fall. The river here is something over 300 feet wide, the channel at the upper end being divided by an island 1,600 feet long. Below this shoal there is navigable water for three-fourths of a mile to



SHOALS OF THE CHATTAHOOCHEE.

Scale: 1 inch to 40 miles.

Mooney's Shoal.—This is 5,600 feet long with 3.25 feet fall, the river ranging from 150 to 250 feet wide. Below this there is $4\frac{1}{2}$ miles of deep water to the mouth of the Chestertee river at

Overby's Shoal.—Which is 300 feet long with 6.92 feet fall, the river varying from 250 to 600 feet wide. For $2\frac{1}{2}$ miles there is navigable water to

Brown's Mill.—This shoal is 8,500 feet long with 16.92 feet fall, the river varying from 250 to 600 feet wide. For ten miles below Brown's there is navigable water to

Pirkle's Shoal.—This is 4,600 feet long with 3.9 feet fall, the river 300 to 400 feet wide. For two miles there is good water to

Garner's Bridge Shoal and Winding Shoal.—This shoal is 11,820 feet long with 16.90 feet fall. This includes the entire distance from Hammond's Island to the shoal below Bowman's Island. For 26 miles there is navigable water to

Island Shoal.—This shoal is 500 feet long with nine feet fall. The river is from 400 to 800 feet wide, the channel being divided by two islands. Six miles from this is the beginning of

Roswell Shoal.—Here in 10,400 feet (to Kelpin's) there is 13.38 feet fall, with an average width of 600 feet. From Kelpin's to Bull Sluice (two miles) there is nearly 40 feet fall. The river between these points varies greatly in width, the channel being divided by many small islands. Two miles below is

The Devil's Race Course Shoal.—The river here is 450 feet wide with 19.95 feet fall, measuring from Cochran's Shoal. About one mile below this is

Dimpsey's Ferry Shoal.—This is 5,200 feet long, 300 feet wide, and has ten feet fall. The next shoal is

Pace's Ferry.—The river here is 300 feet wide and has 6.50 feet fall in 4,264 feet.

SECTION 2.—FROM THE WESTERN AND ATLANTIC RAILROAD BRIDGE TO WEST POINT.

This section is about 108 miles long with an aggregate fall of 172 feet. There is less than ten miles of *actual* shoal here with 99 miles of navigable water, which needs no improvement for the navigation of small steamboats drawing not more than three feet. On this section the river bed is very uniform—about 300 feet wide at the water surface, with high banks and bottom of rock. There are no sand bars, snags or other obstructions, except those named below, and the whole may be opened to navigation at a moderate cost. For six miles below the bridge there is good water to

Green and Pope's Shoal.—This is 1,677 feet long with 1.25 feet fall, the river being 250 feet wide. For nine miles below this there is good water to

Austell's Shoal.—This is 719 feet long, with 0.82 feet fall, and 250 feet wide. For 10 miles there is good water to

"Red Man's" Shoal.—The river widens here from 300 to 500 feet, with 0.85 feet fall in 1,616 feet. Seven miles below is

Mederis Shoal.—Width here varies from 500 to 600 feet, with an aggregate fall of 8.42 feet in 7,367 feet. Eight miles below is

Sewell's Island Shoal.—The channel here is divided by Sewell's Island, the left hand being 100 and the right hand 200 feet wide. The shoal is 3,684 feet long, with 2.48 feet fall. Four miles below is

Bridge Shoal—at the crossing of the Griffin and North Alabama Railroad. This shoal is 300 feet long, with 0.40 feet fall, the river 325 feet wide. Four miles below is

Bull Sluice No. 2.—This is 287 feet long, with 1.70 feet fall. One mile below this is

Hemp's Shoal.—The river here is 575 feet wide, with .87 feet fall in 500 feet. The next is

McIntosh Shoal.—The channel here at head of shoal is 200 feet wide, with 7.24 feet fall in 3,790 feet. Three miles below is

Hollinsworth's Mill.—This shoal is 400 feet wide, 750 feet long and has 3.51 feet fall. The next is known as

"Bush Head" Shoal.—The river here is 700 feet wide, with 517 feet fall in 2,120 feet. Two miles below this is

Daniel's Mill.—At the head of this shoal the river is 1,000 feet wide, with 8.85 feet fall in 5,334 feet. The next is

Jackson's Mill.—This is really two shoals. The upper has 4.73 feet fall in 500 feet, the lower 5.06 fall in 3,655 feet. Five miles below this is

West Point Shoals.—Here the river is 500 feet wide, with 1.78 feet fall in 2,955 feet.

SECTION 3—FROM WEST POINT TO COLUMBUS.

This section is 33 miles long, with a measured fall of 318.31 feet. The surface of the water at the railroad bridge, West Point, is 594 feet above tide, at Columbus it is 238 feet. For about one-half

the distance between these two points the river is deep with a moderate current, there being unobstructed pools between the shoals of from $\frac{1}{4}$ to 4 miles long. The river bed, in many places, is very wide, dotted by numerous islands. Between these islands narrow channels find their way. Over two of the longest shoals these channels may be converted into commodious manufacturing canals by constructing dams between the islands. In these canals dams may be placed at proper intervals. There is an abundance of the best material at hand for the construction of such works. One of these shoals begins at Jack Todd's, 3 miles below West Point, and extends to Houston Ferry, $7\frac{1}{2}$ miles. There are now two factories on this shoal. The entire shoal has a fall of 51.31 feet, the factories using but a very small portion of it. From Houston Ferry there is good water three miles to

Haggitt's Island.—Two thousand three hundred feet below this is Cook's Island; three hundred feet below Cook's Island is Round Island, and nine hundred feet below Round Island is another island. These may be connected by dams forming a natural canal 100 feet wide, 9,600 feet long and with something over 100 feet fall. At the end of the last island the river is 1,300 feet wide. One mile below it suddenly contracts to 600 feet with 15 feet fall in this distance. Here it widens to 1,100 feet, with 10 feet fall in 5,200. From this point to Tate's Shoal there is deep water. Here in a distance of two miles there is 22 feet fall. From Tate's to Mulberry Creek (one mile) there is deep water. The river here is 1,000 feet wide with a fall of 30 feet in two miles. The next shoal is

Coweta Falls.—Here, in a distance of 12,800 feet there is 80 feet fall. About one-half mile below this shoal is the Eagle and Phoenix mills. These mills have 44,000 spindles, 1,500 looms, and operates besides seven sets woolen machinery, 48 cards and 120 woolen looms. The Columbus Manufacturing Company's mill has 4,600 spindles and 134 looms. The next (cotton) factory above Columbus is the Georgia and Alabama. This has 6,000 spindles and 150 looms. About one and a half miles above this is the Chatahoochee Factory. This is five miles from West Point, and a small steamboat plies between the two places. The next mill belongs to the West Point Manufacturing Company. It has 6,000 spindles and 150 looms. These factories are immediately upon the river.

The following factories are situated upon the tributaries of the Chattahoochee and but a short distance from that part of the river under consideration: Troup Factory, 2,200 spindles and 100 looms; Wilcoxon Manufacturing Company's mill, 2,000 spindles; Concord Factory, one set woolen cards; Laurel Hill, one set woolen cards; Thompson & Pattillo mill, one set woolen cards; Roswell Manufacturing Company (2 mills), 13,500 spindles and 150 looms; Wilio Cotton mills, 3,000 spindles.

OCMULGEE RIVER.

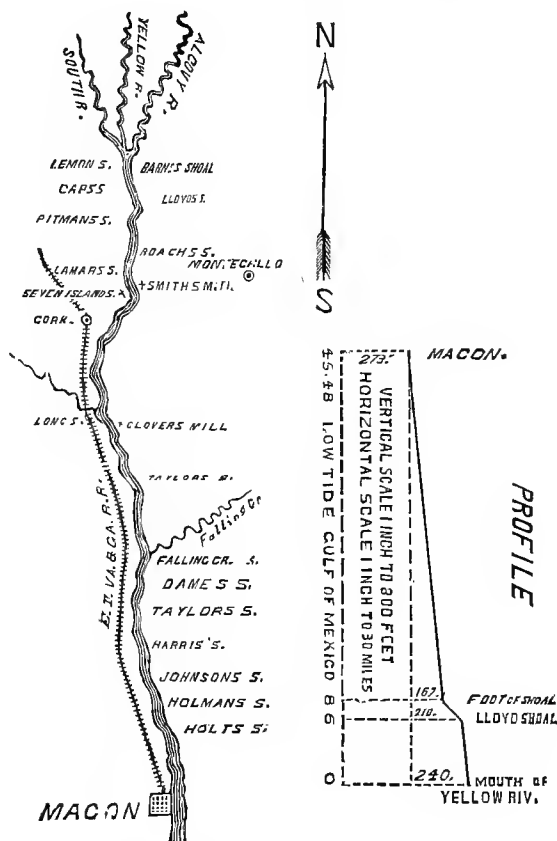
This stream is formed by Yellow and South rivers, which unite in Newton and Butts counties. About two miles below this junction the Alcovy river comes in. This stream is about the size of South river and furnishes many fine water powers. From the head of the Ocmulgee to Macon is 46 miles, and upon this portion the water powers are found. At the junction of South and Yellow rivers the elevation of the surface of the water at low water above mean low tide is 513 feet. At Macon it is 273 feet, giving an aggregate fall of 240 feet. The general direction of this part is nearly due south, flowing along Butts, Jasper, Monroe, Jones and Bibb counties to Macon, which in years past was the head of navigation. These counties had in 1880, according to the United States census of that date, a population of 77,730. The same authority gives the value of personal and real estate at \$14,054,007, and the annual value of farm products at \$3,127,437. There were 109 manufacturing establishments and work shops in operation, and these produced annually products valued at \$1,872,241. There are no woolen mills and but one cotton mill in this enumeration, the Bibb Manufacturing Company's mill at Macon, and this is operated by steam. This mill has 16,000 spindles and 880 looms.

The valley of the Ocmulgee and the adjacent country is rich in agricultural products, especially cotton. The climate is healthful, and facilities for transportation good. The East Tennessee, Georgia and Virginia Railroad follows the river from Macon to Cork (about thirty miles), passing almost upon its banks. It here leaves the river bank, but is at no point more than nine miles distant from it.

The first shoal is known as

Barnes' Shoal.—This is at the head of the river, and has a fall of

11.65 feet in 500 feet. A rocky barrier crosses the river at the head of the shoal, forming a perfect natural dam with deep water above it. There is a mill here. One mile below is Lemon Shoal. The



SHOALS OF THE OCMULGEE RIVER.

Scale: 1 inch to 10 miles.

channel here is about equally divided by a small island. At the foot of the island a reef of solid rock, exposed at low water, crosses the river, completely closing the right-hand channel, and throwing the entire stream to the left bank through an opening about fifty

feet wide. There is a fall here of 3.95 feet in 1,300 feet. One mile below this is Key's Ferry. The Alcovy river comes in here, furnishing a volume of water about equal to Yellow river. From Key's Ferry to

Harvey's Mill there is deep water. The shoal there is 600 feet long with four feet fall. About two miles below this mill is

Cap's Shoal.—The river here is divided into three channels by islands, the shoal being at the foot of the upper island. It consists of a reef of solid rock crossing the streaming and damming up the water. It is 400 hundred feet long with 5.59 feet fall. One-half mile below is

Lloyd's Shoal.—This is 9,500 feet long with 40 feet fall, the river being 300 feet wide at the head. Heard's creek comes in just below this shoal. One mile below is

Pitman's Shoal.—There is 3.50 feet fall here in 1,800 feet. The shoal consists of rocky reefs. Three miles below this is

Roach's Shoal.—This is 3,900 feet long with 7.50 feet fall. There is a mill and cotton gin here. One-half mile below is

Lamar's Shoal.—The river here is 325 feet wide with 3.95 feet fall in 1,300 feet. Below this

Seven Islands Shoal begins. The river is very wide, but divided by islands into narrow channels. In 1,300 feet there is 19.51 feet fall. From Seven Islands to McArthur's Ferry, one-half mile above the mouth of the Towaliga river, there is good water. One-half mile below this

Long Shoals begin. These shoals are 1,600 feet long with 11.92 feet fall. There are two mills here. Six miles below is

Falling Creek Shoal.—This is 3,200 feet long with 1.57 feet fall. From Falling creek to

Dames Shoal is about half mile. This shoal has 3.64 feet fall in 550 feet. The river is wide and filled with small islands. One mile below this is *Taylor's Shoal* with 5.73 feet fall in 2,100 feet, the river at the head being about 300 feet wide. The next is known as

Harris' Shoal.—3,000 feet long with 2.31 feet fall. The next is

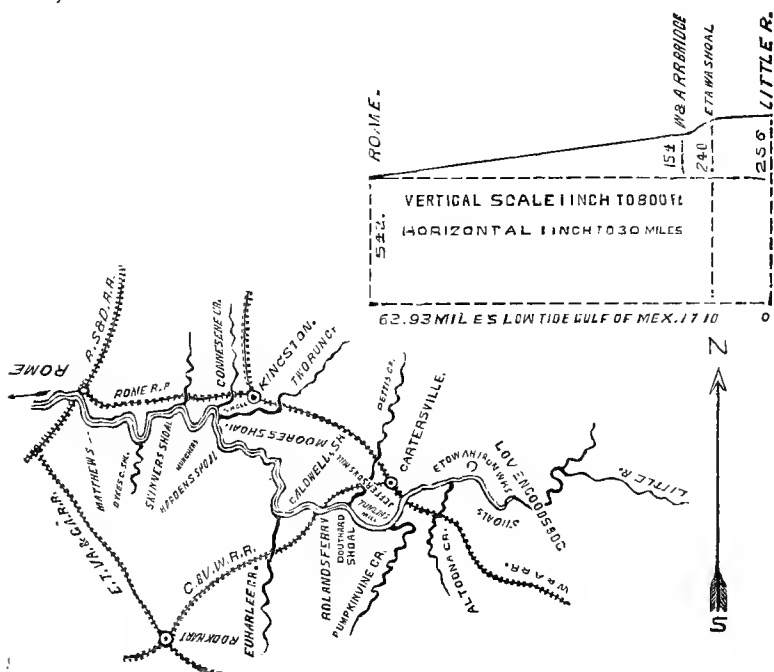
Johnson's Shoal.—The river widens here very much, being divided by three small islands. In 1,500 feet there is 5.12 feet fall. Below this is

Holt's Shoal, a rock bar 400 feet long with 3.72 feet fall. This is the last shoal.

There is in the Ocmulgee an abundance of water, even in the driest summers, and it is never frozen in winter.

THE ETOWAH RIVER.

This stream rises in the mountains of Northeast Georgia, in Lumpkin county, and after flowing in a southwest direction through Dawson, Forsyth, Cherokee, Bartow and Floyd counties unites, at Rome, with the Oostanaula river and forms the Coosa.



SHOALS OF THE ETOWAH.

Scale: 1 inch to 10 miles.

The valley of the Etowah is noted for its rich agricultural products, consisting in part of cotton, wheat, corn, oats and rye, and luxuriant fields of grass. The climate is mild and exceedingly healthful—not subject to extreme variations of heat or cold, nor to the long drouths which affect some portions of the cotton belt. The hills which border the valley are rich also in minerals, iron and manganese being the principal. There are besides extensive beds of

marble along its tributaries, and valuable gold mines on its headwaters. From the mouth of Little River, near the western boundary of Cherokee county to Rome, the river falls rapidly, giving an immense water-power which may be cheaply utilized. This section is 62 miles long, the surface of the water at Little River having an elevation above tide of 798 feet. At Rome the elevation is 542 feet, giving an aggregate fall of 256 feet in the distance named. From Little River to the W. & A. R. R. bridge, near Cartersville, there is a fall of 102 feet in 17 miles. This fall is, however, principally confined to a space of five miles, beginning at the mouth of Altoona Creek and ending at the Etowah Iron Works two miles above the bridge. At this point the river furnishes at ordinary low water 1,300 cubic feet per second, and this with a fall of 102 feet would give about 15,000 available horse-power. Indeed, there is scarcely a mile between this point and Rome where water, power might not be cheaply used. Along the whole section there is an abundance of material close at hand for the construction of dams while timber of the best quality clothes the adjacent hills. The W. & A. R. R. crosses the Etowah two miles below these shoals, and passes along the river from thence to Kingston, being at no point, more than seven miles distant from it. From Kingston to Rome the Rome Railroad runs most of the way immediately upon the banks of the Etowah, affording excellent means of transportation. From Rome there is steamboat navigation on the Oostanaula to Carter's landing, 105 miles, and on the Coosa to Greensport 153 miles. The United States government is now opening up the shoals of the Coosa, and it is confidently expected that navigation will be opened at an early day to the coal mines in the vicinity of that river. The three counties traversed by that part of the Etowah, upon which the water-powers here treated of are found, had in 1880 a population of 57,433. According to the United States census of that date real and personal estate in these counties was valued at \$10,145,582 and farm products at \$2,528,094. There were 1,08 manufacturing establishments of all kinds, employing a capital of \$3,209,788 and producing articles whose value is set down at \$6 201,897. Comprised in these factories are 57 flour and grist mills, 14 saw mills, one furniture factory and four foundries and machine shops. There are also three cotton factories whose capital is \$67,000 and annual product \$93,462. About half mile below the mouth of Little River the first shoal is found at

Wheeler's Mill.—The fall here is 5.5 feet in 1,300 feet, the river being 250 feet wide. From Wheeler's to the Bartow county line there are a number of shoals with but little fall.

From the county line to the Etowah Iron Works, there are a succession of shoals, forming one of the finest water-powers in the State. Near these shoals there are great beds of iron ore of superior quality, which at one time supplied extensive foundries and iron works known as the Etowah Iron Works. These works were destroyed during the late war and have not been rebuilt. From the iron works to the railroad bridge there is deep water here.

Jefferson's Mill Shoal begins.—This has two feet fall in 1,500 feet, the river being 282 feet wide. One mile below this is

Tumlin's Mill Shoal, with a fall of eight feet in 1,100 feet, the river being 177 feet wide. Three miles from this is

Douthard's Shoal.—Here there is 3.50 feet fall in 3,500 feet. Nine miles from this is

Caldwell's Shoal.—The fall here is 2.50 feet in 1,500 feet. Four miles below is

Mark Hardin's Upper Shoal.—This has 2.47 feet fall in 2,000 feet. Half mile from this is

Mark Hardin's Lower Shoal.—Here there is 6.46 feet fall in 1,200 feet, the river being 442 feet wide at head of shoal. Two miles below is

Moore's Shoal—At the mouth of Two-Run Creek. Here there is three feet fall in 1,300 feet, the river 357 feet wide. The next is

Murcherson's Shoal.—The fall here is six feet in 3,000 feet, the river being 302 feet wide at head of shoals.

Skinner's Shoal—Is four miles from Murcherson's. The fall here is two feet in 1,200 feet. Four miles from this is

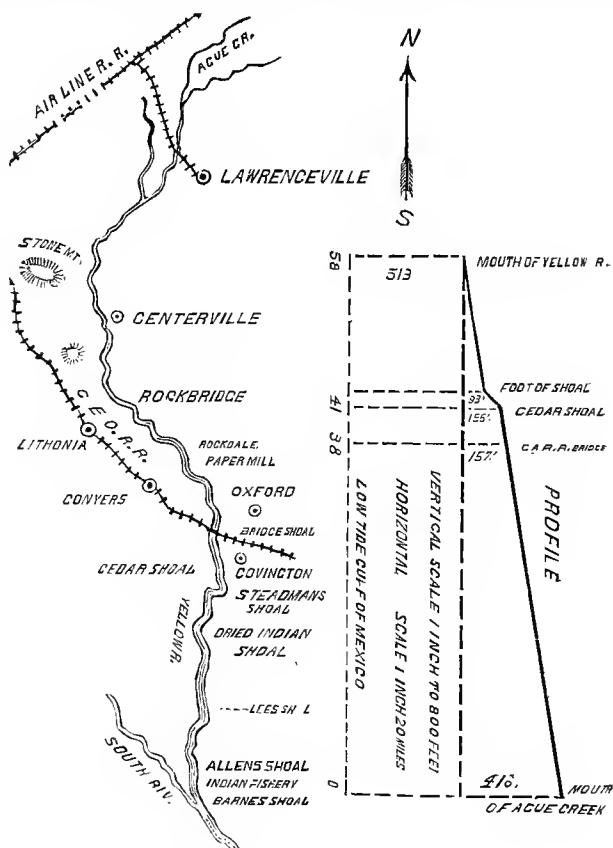
Dyke's Creek Shoal.—There is 3.50 feet fall here in 2,500 feet, the river at the head of shoal being 281 feet wide. Four miles below is

Matthew's Shoal, with 1.20 feet fall. Between this shoal and Rome two railroads cross the Etowah. The Cartersville and Van Wert crosses it about three miles from Cartersville and follows its general direction for several miles.

YELLOW RIVER

rises in Gwinnett county, in the range of hills commonly known as the Chattahoochee Ridge. It flows thence in a direction nearly

south for 58 miles to its junction with South River, where they form the Ocmulgee. It passes through the following counties: Gwinnett, DeKalb, Rockdale and Newton. The towns near it are Lawrenceville, two miles; Stone Mountain, five miles; Lithonia, Lawrenceville, two miles; Stone Mountain, five miles; Lithonia,



SHOALS OF YELLOW RIVER.

Scale: 1 inch to 10 miles.

two miles; Conyers, two and a half miles, and Covington, three miles distant. The upper portion of this stream is very tortuous, with many abrupt turns and bends, and with high spurs and steep

cliffs overhanging it, particularly for 10 or 15 miles near Stone Mountain. The causes which produced this rare mountain phenomenon seem to have disturbed the adjacent country for some distance, and to this, no doubt, may be ascribed the roughness which characterizes this part of Yellow River Valley. On this section, however, may be found many fine water-powers and the best quality of granite in inexhaustible quantities.

The principal tributaries of Yellow River are Sweetwater, Roland's, Pew's Mountain, Little Mountain, Haynes, Gun, Hurricane, Beaverdam, Turkey and Dried Indian Creeks.

The four counties through which the river flows had, in 1880, a population of 54,489. Real and personal estate was valued at \$7,963,695, and farm products at \$2,669,203. There were 233 manufacturing establishments of all kinds, employing \$550,388 capital and producing articles valued at \$1,083,252. In addition to these there are two cotton factories, "The Covington Cotton Mills," at Cedar Shoals, and the "Sheffield Cotton Mills," operating 3,160 spindles. Embraced in the manufacturing establishments above are 67 flour and grist mills, 44 saw mills. The Rockdale paper mill is located on Yellow River, near Conyers. From this point to the Georgia Railroad bridge is five miles. Here we find

Bridge Shoal—This shoal consists of a rock reef 500 feet long with 4.33 feet fall. The river here is 125 feet wide. Three miles below this is

Cedar Shoal.—Here there is 63 feet fall in 4,875 feet. At the upper dam the river is 290 feet wide, and at the lower 700 feet. If the whole fall was used it would give at extreme low water about 4,000 horse-power. Three miles from Cedar Shoals is

Dried Indian Shoal, with a fall of 7.24 feet in 1,500 feet, the river being 200 feet wide. Twelve miles below this is

Lee's Shoal.—This is 1,400 feet long, with 3.97 feet fall. The river is 300 feet wide.

Allen's Shoal is one mile below this. There was a mill here at one time. The shoal is a solid rock reef 500 feet long, with 1.83 feet fall, the river about 200 feet wide. Two miles below is

"*Indian Fishery*" *Shoal*.—This is a solid rock reef crossing the river at right angles with its course, and forming a perfect natural dam. The river is 300 feet wide with 12 feet fall in 400 feet. There is a mill at this point. This is the last shoal. The banks of Yel-

low River are high and firm and the bottom of rock. There is at all points abundance of good material for the construction of dams close at hand, both stone and timber.

SOUTH RIVER

risers in Fulton, and has its headwaters within the corporate limits of Atlanta. From its head to its mouth is 52 miles. Its direction is nearly southeast, flowing through Fulton, DeKalb, Henry, Rockdale, Butts and Newton counties. The elevation of the surface of the water at the Atlanta Water Works is 878 feet above mean low tide. At the mouth of South River it is 513 feet, making an aggregate fall of 365 feet in 52 miles. Its principal tributaries are Island Shoal, Wild Cat, Snapping Shoal, Cotton River, Honey, Polebridge, Snapfinger, Shoal, Fork, Sugar and Intrenchment creeks. All of these streams have one or more mills on them. There are besides these a number of smaller feeders. Its valley is rich in agricultural products, while its close proximity to the capital and principal railroads of the State renders all this section especially desirable.

The five counties through which South River flows had in 1880 a population of 106,599. The value of real and personal estate was \$28,417,762 and farm products \$3,408,896 for that year.

There were about 449 manufacturing establishments and shops of every description, employing a capital of \$3,169,984, and producing articles whose value was \$6,130,265. These embraced 75 flour and grist mills, 43 saw mills, four paper mills, four furniture factories, seven foundries and machine shops, and seven cotton mills.

The Atlanta Water Works are situated on this stream four miles from the city. The first shoal is found at

Hulsey's Mill, 11 miles from Atlanta. Here, in about 300 feet, is 12 feet fall, the river being from 25 to 50 feet wide. Five miles below this is

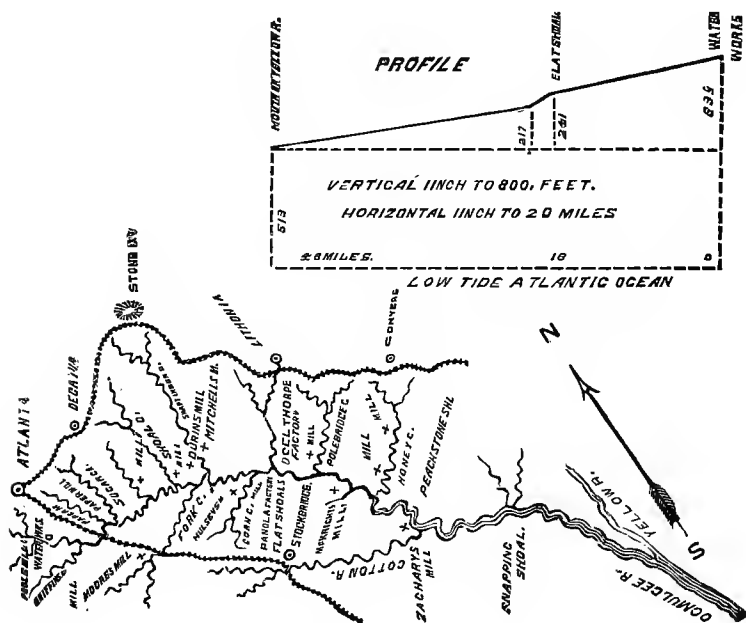
Flat Shoals.—Here there is 25 feet fall in 3000 feet. Oglethorpe factory is located here. This mill has 3,000 spindles and employs \$75,000 capital.

McKnight's Mill is 10 miles below this. The river at the dam here is 200 feet wide with 12 feet fall. Seven miles from McKnight's is

Peachstone Shoals.—The fall here is 12 feet and the river at the dam 200 feet wide. Zachrey's mills are located here.

Snapping Shoals are nine miles below this. From Snapping Shoals to *Hartfield's Mill* is about six miles, and three miles beyond is the mouth of the river.

Yellow river, South river, and the Ocmulgee (which is formed by the junction of the former streams), present to the manufacturer of cotton wonderful advantages in the matter of location, motive-power, climate and health. In all this section provisions are cheap and abundant, and operatives can be fed at very moderate rates. Near



the junction of the rivers above-named the great water-powers are situated. These consist of three principal falls, known as Indian Fishery, Barnes' and Lloyd's shoals. At all of these shoals there are solid rock reefs extending entirely across the river and forming

admirable natural dams. The fall in the river-bed is rapid and there is little or no flooding or back-water. The climate being mild, inexpensive frame structures, costing but a trifle, answer all the purposes of expensive brick or stone buildings found absolutely necessary in colder climates. There is an abundance of building material, such as granite, timber, and a superior quality of clay for brick-making, while the section for miles on either hand is the best cotton-producing portion of the State. The principal drawback to the development of these powers has been found in the want of cheap transportation. To obviate this a railroad has been chartered from Covington to Macon, and the line located immediately upon the bank of the river near these falls. This road will probably be opened in a short time. The route for the great projected canal from the Mississippi river to the Atlantic has also been located by the United States Engineer Department along Yellow river and the Ocmulgee and past these shoals.

The fall here, in five miles, is 116 feet, and this, with 2,500 cubic feet per second at extreme low water, gives about 30,000 available horse-power.

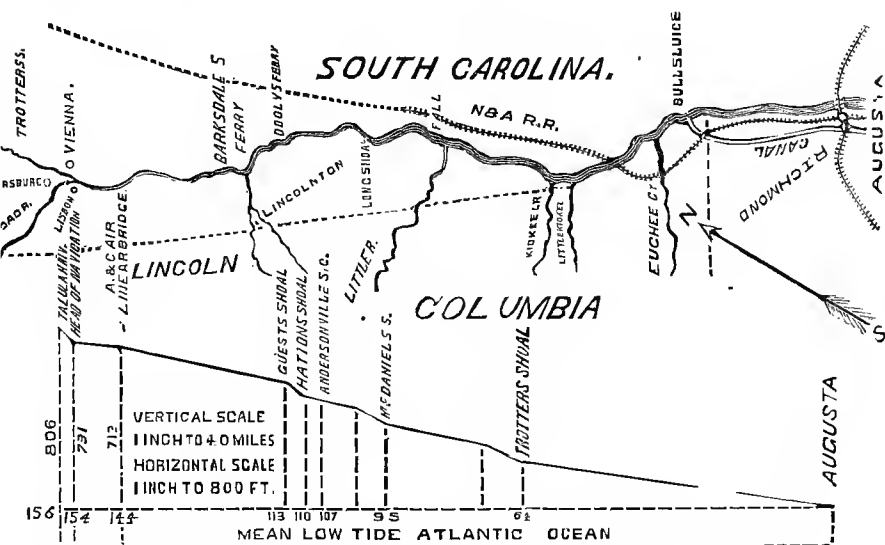
During the spring and winter months the supply of water is superabundant. These shoals are distant from Covington, sixteen miles; from Macon, forty-seven miles; from Jackson, nine miles; from Monticello, twelve miles; from Atlanta, by rail, fifty-seven miles, and from Savannah, 233 miles.

THE SAVANNAH RIVER.

The eastern branch of the Savannah, known as the Chattooga river, has its head-waters in the mountains of North Carolina. Flowing from thence in a direction nearly southwest to the southern boundary of Rabun county, it there unites with the Tallulah and forms the Tugalo. From this point its course is southeast to Andersonville, S. C., where it unites with the Seneca, and from thence to the sea is known as the Savannah river. The Savannah forms the eastern boundary of Georgia, separating it from South Carolina.

From the sea to the city of Savannah (20 miles), there is navigation for the largest class of ships and sea-going steamers. Between

Savannah and Augusta (248 miles) river steamboats drawing 4 to 5 feet ply, except during the stage of extreme low water. Above Augusta for 154 miles to Panther creek, in Habersham, there is navigation for small craft known as "pole-boats," which ply between the points named, at all seasons, affording a cheap and



SHOALS OF THE SAVANNAH RIVER FROM AUGUSTA TO TALLULAH.

Scale: 1 inch to 10 miles.

convenient mode of transportation for the products of the river valley and adjacent country. The United States Government is now improving this part of the river so as to afford navigation for small steamboats.

The country on both sides of the river from Augusta to Knox's Bridge (124 miles) is cultivated chiefly in cotton, and produces on an average half a bale to the acre, or from 3 to 7 bales to the hand. It is well adapted also to the production of tobacco, grain, indigo, silk, and various kinds of fruits, especially the grape. From Knox's Bridge to the mountains corn is the principal crop, the average product being 35 bushels to the acre. The entire section is well timbered. Grass grows abundantly during the summer months.

and in winter the hillsides are covered with a short growth of green cane which makes excellent pasturage.

In Lincoln county (4 miles west of Goshen) the Sale & Lamar gold mine was opened about six years ago with "a plant" costing \$4,000. The yield from January 1st to November 15, 1878, was \$12,000 in gold. The ore assayed \$20 per ton, and is mined and worked at a cost of \$3.50 per ton. There are several other mines in this neighborhood. On the dividing line between Edgefield and Abbeville districts, S. C., is the well-known Dorn mine. At Trotter's Shoal there is another mine said to yield well, while 15 miles northeast of Andersonville extensive arrangements have been made for hydraulic mining. In fact, there are pickets of gold throughout this whole section. In Oconee county there are extensive beds of iron ore with an abundance of fuel and limestone near at hand. At Panther's creek limestone crops out, and there are a few lime kilns that supply the neighborhood, and ship a portion to the counties on the river below.

The different points on the river are distant from the railroads as follows: Petersburg to Washington, Georgia, 20 miles; Petersburg to Abbeville, S. C., 25 miles; Andersonville to Anderson, S. C., 13 miles. The Air-Line Railroad crosses the river at Fort Madison, 144 miles above Augusta. From Toccoa City, nine miles west of this, a narrow gauge railroad runs south 51 miles to Elberton, the larger portion of the route being from 9 to 12 miles from the river. It is proposed to extend this road to Augusta. A railroad is being constructed also from Greenwood, S. C., to Augusta. For 25 miles in South Carolina this road is only 8 miles from the river. It then crosses into Georgia 15 miles above Augusta, and follows the river valley to that city.

The following table, taken from the records kept at the canal basin, Augusta, shows the trade by pole-boats on the upper Savannah river for the years indicated:

| | 1876. | | 1877. | | To Nov. 9, 1878. | |
|------------------------|-----------|----------|-----------|----------|------------------|----------|
| | Received. | Shipped. | Received. | Shipped. | Received. | Shipped. |
| Bales cotton. | 12,176 | ..... | 11,700 | 7,500 | ..... | ..... |
| Merchandise, p'ck'ges. | 50 | 20,550 | 80 | ..... | 40 | ..... |
| Cattle. | 35 | ..... | 30 | ..... | ..... | ..... |
| Phosphate bags. | ..... | ..... | ..... | 21,200 | ..... | 18,000 |
| Wood, cords | 401 | ..... | 500 | ..... | 350 | ..... |

A package of merchandise is supposed to weigh 100 pounds, so the up-freight may be considered as 2,500 tons, and the down-freight 12,000 bales cotton. The yearly average receipts of cotton at Augusta, prior to 1880, amounted to 180,000 bales. The same year the product on the upper Savannah is given at 70,489 bales.

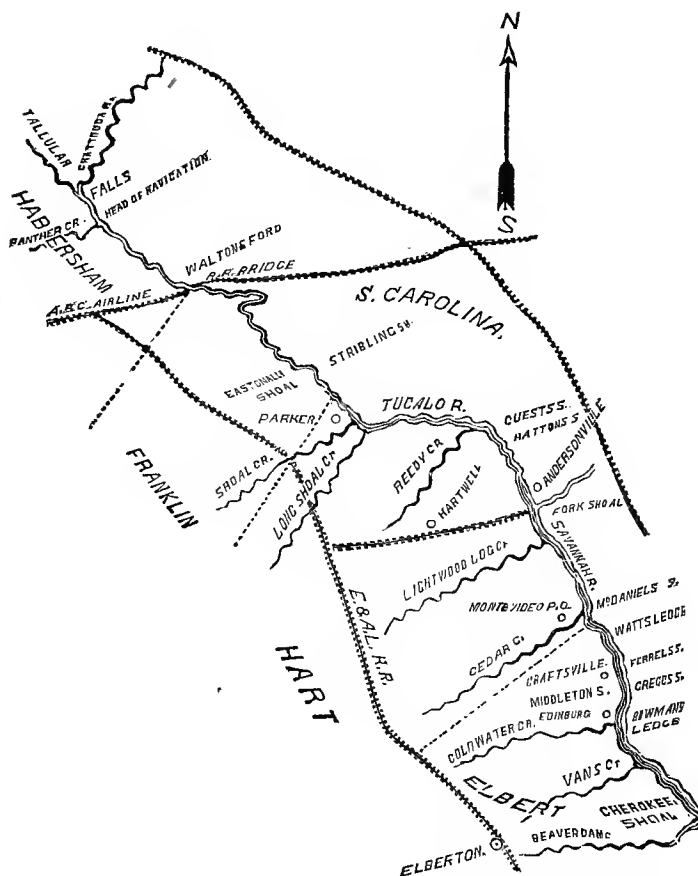
The following is given as the charge on a bale of cotton from various points to Augusta and the yearly shipments:

| | Per Bale. | Bales shipped. |
|-------------------------|-----------|----------------|
| Above Craftsville..... | \$2.75 | 200 to 400 |
| Craftsville..... | 2.25 | 2,000 |
| Cherokee Shoal..... | 1.75 | 3,000 to 4,000 |
| Petersburg..... | 1.50 | 1,200 to 1,600 |
| Little River, S. C..... | 1.00 | 300 to 500 |
| Fury's Ferry..... | 50 | |

The opening of the river to steamboat navigation and the completion of the railroads now under construction will no doubt greatly reduce these charges.

There are at Augusta 10 cotton factories, viz.: The "*Augusta Factory*," operating 24,200 spindles and 800 looms. "*Augusta Waste Works*," 11 machines for cleaning cotton. "*Riverside Mills*," 2,500 spindles. "*Enterprise Manufacturing Company*," 14,000 spindles, 300 looms. "*Richmond Factory*," (10 miles from Augusta) 3,500 spindles. "*Globe Cotton Mills*," 4,850 spindles. "*John P. King Manufacturing Company*," 33,000 spindles, 1,000 looms. "*Sibley Manufacturing Company*," 3,000 spindles, 1,000 looms. "*Summerville Mills*," 4,000 spindles, 150 looms. "*Stirling Cotton Mills*," 1,696 spindles. These mills operate in the aggregate 116,946 spindles and 3,250 looms, employing a capital of \$3,500,000. There are besides these a factory at Andersonville, S. C., employing 20 hands, and one on Shoal creek, in Elbert county, the "*Shoal Creek Factory*," 375 spindles and 20 operatives.

From Augusta to the head of navigation the river flows past the following counties in Georgia: Richmond, Columbia, Lincoln, El-



SHOALS OF THE SAVANNAH AND TUGALOO RIVERS, FROM CHEROKEE SHOAL TO TALLULAH.

Scale: 1 inch to 10 miles.

bert, Hart, Franklin and Habersham. The counties had in 1880, according to the U. S. Census, a population of 93,764, and 193 manufacturing establishments of every description.

The principal streams emptying into this part of the river (from Augusta to the head of navigation on the Georgia side) are the Eu-chee creek, Big Kiokee creek, which near its mouth is 12 feet wide at the surface of the water, six inches deep, and has 30 cubic feet of water per second at extreme low water. Little river, 50 feet wide, 3 feet deep and has 100 cubic feet per second. Soap creek, 15 feet wide and one foot deep. Broad river, 300 feet wide, 2 feet deep and has 450 cubic feet per second. Pole-boats ascend this river 5 miles to the foot of Anthony's shoal, where there is a fall of 17 feet in two miles. Beaverdam creek, 36 feet wide and 1 foot deep. Lightwood-Log creek, 30 feet wide, 3 feet deep. Pole-boats can go up this stream half a mile. Big Beaverdam creek, 45 feet wide and 2 feet deep; two miles from the mouth there is a fall of 80 feet in 300 yards. Shoal creek. Gum-Log creek, 15 feet wide, and Panther's creek, 45 feet wide, 18 inches deep and has 54 cubic feet per second.

The first shoal of importance as a water-power is

Long Shoal (29½ miles above Augusta). This shoal is 5 miles long with 35 feet fall, the river 1,800 feet wide. The next is.

Trotter's Shoal (64 m.) 7 miles long with 74.88 feet fall, the river 750 feet wide. The next is

Cherokee Shoal (75 m.) one-half mile long with 9 feet fall, the river 1,800 feet wide.

Bowman's Ledge (83 m.) 120 feet long with 3 feet fall, river 600 feet wide.

Gregg's Shoal (85½ m.) one mile long with 14 feet fall, river 1,300 feet wide.

Middleton Shoal (88½ m.) one mile long with 18 feet fall, river 2,100 feet wide.

Ferrell's Ledge (89 m.) 360 feet long with 3 feet fall, river 960 feet wide.

Watts' Ledge (61½ m.) fall 25 feet in 900 feet, river 900 feet wide.

McDaniel's Shoal (95 m.), 30 feet fall in 5 miles, river 1,500 feet wide.

Fork Shoal (107½) at the head of Savannah river, 1,300 feet long, 3 feet fall, river 750 feet wide.

TUGALO RIVER.

Hatton's Shoal (110 miles above Augusta) one-half mile long, fall 39 feet, river 1,500 feet wide.

"*Shoal*" (113 m.) 4 feet fall in 1,800 feet, river 300 feet wide.

Guest's Shoal (113½ m.) one mile long, 23 feet fall, river 1,200 feet wide.

Stribbling's Shoal (130 m.) one-half mile long, fall 2 feet, river 300 feet wide.

Eastonolly Shoal (131 m.) one-half mile long, fall 2 feet, river 750 wide.

Head of Navigation (154 m.) Here there is a fall of 75 feet in 2½ miles. There is 654 cubic feet of water here per second, and this with the above fall will give an available horse-power of 56.34.

At Clarkesville, in Habersham county, there is a woolen mill with four sets of cards and fifty looms, and another woolen mill at Parker's Store, in Hart county, with two sets cards.

List of Water Powers Arranged by Counties.

| LOCATION OF WATER POWER. | POINT OF SECTION. | Condition of stream. | Cubic feet per second. | Fall in feet. | Length of shoal. | Width of stream. | Theoretical horse-power with one foot-fall or head. | Available horse-power with one foot-fall or head. | Difference between high and low water in feet. | Elevation of surface of water above tide. | Distance from Thompson's bridge. | BY WHOM SURVEYED. | REMARKS. |
|----------------------------|---------------------------------|----------------------|------------------------|---------------|------------------|------------------|-----------------------------------------------------|---------------------------------------------------|------------------------------------------------|-------------------------------------------|----------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Chattahoochee River</i> | | | | | | | | | | | | | |
| Hall county | Thompson's Bridge. | Low. | 329. | 6.71 | 5,500 | 300 | 104.97 | 83.97 | 24 | 989.2 | 0. | U. S. river surveys by McCalla | Cross sections and gauges were had at the following points: |
| Hall county | Shallow Ford Shoal. | Spring. | | 3.15 | 3,600 | 200 | 104.97 | 83.97 | | 982.10 | 3. | left U. S. Civil | At Shallow Ford by C. A. Locke, C. E., at Columbus by Mr. Barrow, C. E., Warsaw |
| Hall county | Johnson's Shoal. | " | | 3.25 | 5,600 | 150 | 104.97 | 83.97 | | | 8 1/2. | " | Ferry by R. L. McCarty, C. E., Carter's Shoal, by E. W. Froebel, C. E., Bice's Bridge by E. W. Froebel, C. E., Seven Islands, B. W. Froebel, C. E., The major portion of the streams emptying into the river along this section have also been gauged by Messrs. Locke, Froebel and Barrow and from these measurements the volume at other points is estimated. |
| Hall county | Owens's Shoal. | " | 1240. | 6.92 | 800 | 350 | 140.12 | 112.10 | | 963.48 | 4 1/2. | Asst Engineers | |
| Hall county | Brown's Mill Shoal | " | | 16.92 | 8,000 | 250 to 400 | 140.12 | 112.10 | 18 | 961.50 | 10. | " | |
| Hall county | Pirkie's Shoal. | " | | 3.90 | 4,000 | 300 to 400 | 140.12 | 112.10 | | | 21. | " | |
| Gwinnett county | Winding or Garner's. | " | | | | | | | | | | " | |
| Gwinnett county | Bridge Shoal | " | | 16.90 | 1,182 | 350 | 140.12 | 112.10 | 17.16 | 945.01 | 23. | " | |
| Gwinnett county | Jones's Shoal | " | 1500. | 8.15 | 1,200 | 260 | 169.50 | 135.60 | | | 39. | " | |
| Gwinnett county | Island Shoal | " | | 9.40 | 5,000 | 400 to 800 | 169.50 | 135.60 | 11.00 | 862.02 | 49. | " | |
| Fulton county | Roswell Shoals | " | | | | | | | | | | " | |
| Fulton county | Head of Shoal to Kelpin's. | " | 1647. | 13.28 | 10,400 | 600 | 186.11 | 148.88 | | 862.02 | 53. | " | |
| Fulton county | Kelpin's to foot Bull's Sluice. | " | | 4000. | 10,000 | 400 to 600 | 186.11 | 148.88 | | | 61 | " | |
| Fulton county | Devil's Race Course. | " | | 19.95 | 10,660 | 450 | 186.11 | 148.88 | | | 64 | " | |
| Fulton county | Dimpsey's Ferry | " | 1720. | 10.00 | 5,200 | 300 | 194.36 | 155.49 | | | 66 1/2. | " | |
| Fulton county | Paces' Ferry | " | | 6.50 | 4,264 | 300 | 194.36 | 155.49 | | | 69. | " | |
| Fulton county | W. & A. R. R. Bridge. | " | | | | | | | | 762.02 | 73. | " | |
| Campbell county | Green & Pope's Shoal | " | 2000. | 1.25 | 1,677 | 250 | 226 | 180.80 | | | 6.80 | " | |
| Campbell county | Ansell's Shoal. | " | 2000. | .85 | 719. | 250 | 226 | 180.80 | | | 15.43 | " | |
| Campbell county | Redman's Shoal. | " | | .85 | 1,616 | 300 to 500 | 226 | 180.80 | | | 25.73 | " | |
| Campbell county | Maders's Shoal. | " | | 8.42 | 7,367 | 300 to 600 | 226 | 180.80 | | | 34.13 | " | |
| Campbell county | Sewall's Shoal. | " | | 2.48 | 30,844 | | 226 | 180.80 | | | 42.73 | " | |
| Campbell county | G. & N. A. R. R. Bridge | " | | | 800 | 875 | 226 | 180.80 | | | 46.73 | " | |
| Campbell county | Carter's Shoal. | " | | .51 | 782. | 900 | 226 | 180.80 | | | 49.93 | " | |
| Campbell county | Bull Sluice No. 2 | " | | 1.70 | 287. | 575 | 226 | 180.80 | | | 50.93 | " | |
| Campbell county | He-n-p's Shoal. | " | | .87 | 600. | | 226 | 180.80 | | | 51.93 | " | |
| Campbell county | McIntosh Shoal. | " | 2560. | 7.24 | 8790. | 1200 | 281.50 | 225.20 | | | 53.93 | " | |
| Heard county | Hollingsworth's Mill. | " | 2600. | 3.51 | | 400 | 293.80 | 235.04 | | | 56.93 | " | |
| Heard county | Three miles below | " | | 2.40 | 1736. | 600 | 293.80 | 235.04 | | | 60.93 | " | |
| Heard county | Hillier's Shoal. | " | | 1.45 | 580. | 600 | 293.80 | 235.04 | | | 61.93 | " | |
| Heard county | Half-mile above Bush Head. | " | | 1.48 | 965. | 600 | 293.80 | 235.04 | | | 62.93 | " | |
| Heard county | Rush Head Shoal. | " | | 6.17 | 2120. | 700 | 293.80 | 235.04 | | | 65.13 | " | |
| Heard county | Daniel's mill | " | | 2.85 | 5384. | 800 | 293.80 | 235.04 | 16.81 | | 68.13 | " | |

List of Water Powers Arranged by Counties.

| LOCATION OF WATER POWER. | POINT OF SECTION. | Condition of stream. | Cubic feet per second. | Fall in feet. | Length of shoal. | Width of stream. | Theoretical horse-power with one foot fall or head. | Available horse-power with one foot fall or head. | Difference between high and low water in feet. | Elevation surface of water above tide. | Distance from mouth of Little River. | BY WHOM SURVEYED. | REMARKS. |
|--------------------------|---------------------------|----------------------|------------------------|---------------------------------|------------------|------------------|-----------------------------------------------------|---------------------------------------------------|------------------------------------------------|----------------------------------------|--------------------------------------|-------------------|-------------------------|
| <i>Little River.</i> | | | | | | | | | | | | | |
| okee county..... | Month Little River..... | Minim. | 1272.20 | Total fall to W. & A. R. bridge | 250 to 1500 ft. | 200 | 250 143.76 115.00 | 250 147.77 118.22 | ..... | 798. | 0 | 0 Majors McCalla | From the month of |
| ow county..... | Lovengood's Bridge..... | Low | 1307.20 | 8.00 | 3500 | 250 | 250 147.77 118.22 | 250 147.77 118.22 | ..... | ..... | 4.21 | and Long U. S. | Little River to Rome |
| ow county..... | Head Etowah Shoals..... | " | 1307.20 | 2.50 | 1500 | 350 | 350 162.95 130.30 | 350 173.75 139.00 | ..... | ..... | 10.20 | Civil Assistant | the river banks are |
| ow county..... | Etowah Iron Works..... | " | 1307.20 | 2.47 | 2000 | 350 | 350 173.75 139.00 | 350 173.75 139.00 | ..... | ..... | 15.90 | Engineers. | from 12 to 18 feet high |
| ow county..... | Foot of Shoal..... | " | 1307.20 | 6.46 | 1200 | 500 | 500 173.75 139.00 | 500 173.75 139.00 | ..... | ..... | 16.10 | " | |
| ow county..... | W. & A. R. Bridge..... | " | 1307.20 | 102 | 1300 | 350 | 350 176.62 141.30 | 350 176.62 141.30 | ..... | ..... | 17.90 | " | |
| ow county..... | Jefferson's Mill..... | " | 1307.20 | 2.00 | 1500 ft. | 300 | 300 147.77 118.22 | 300 147.77 118.22 | ..... | ..... | 18.00 | " | |
| ow county..... | Faulin's Mill..... | " | 1307.20 | 8.00 | ..... | 250 | 250 147.77 118.22 | 250 147.77 118.22 | ..... | ..... | 18.00 | " | |
| ow county..... | Dunthard's Shoal..... | " | 1371 | 8.50 | 3500 | 350 | 350 155.60 124.48 | 350 155.60 124.48 | ..... | ..... | 19.27 | " | |
| ow county..... | Caldwell's Shoal..... | " | 1442 | 2.50 | 1500 | 350 | 350 162.95 130.30 | 350 162.95 130.30 | ..... | ..... | 22.00 | " | |
| ow county..... | Harden's Shoal—upper..... | " | 1537.60 | 2.47 | 2000 | 350 | 350 173.75 139.00 | 350 173.75 139.00 | ..... | ..... | 33.00 | " | |
| ow county..... | Harden's Shoal—lower..... | " | 1537.60 | 6.46 | 1200 | 500 | 500 173.75 139.00 | 500 173.75 139.00 | ..... | ..... | 37.00 | " | |
| ow county..... | Moore's Shoal..... | " | 1563 | 3.00 | 1300 | 350 | 350 176.62 141.30 | 350 176.62 141.30 | ..... | ..... | 37.50 | " | |
| d county..... | Murcherson's Shoal..... | " | 1680 | 6.00 | 3000 | 300 | 300 187.84 151.37 | 300 187.84 151.37 | ..... | ..... | 39.50 | " | |
| d county..... | Skinner's Shoal..... | " | 1695 | 2.00 | 1200 | 300 | 300 191.54 153.23 | 300 191.54 153.23 | ..... | ..... | 43.90 | " | |
| d county..... | Dyke's Creek Shoal..... | " | 1700 | 8.50 | 2500 | 800 | 800 192.10 153.68 | 800 192.10 153.68 | ..... | ..... | 46.00 | " | |
| d county..... | Mathew's Shoal..... | " | 1700 | 1.20 | ..... | 800 | 800 192.10 153.68 | 800 192.10 153.68 | ..... | ..... | 50.00 | " | |
| d county..... | Rome..... | " | 1700 | 1.20 | ..... | ..... | ..... | ..... | ..... | ..... | 542.02 | " | |
| | | | | | | | | | | | 62.93 | | |

*O. A. Locke Estimated.

List of Water Powers Arranged by Counties

| LOCATION OF WATER POWER. | POINT OF SECTION. | Cubic feet per second | Theoretical horse-power of 1 ft. head. | Available horse-power of 1 foot head. | Theoretical power of 10 feet head. | Available power of 10 feet head. | CONDITION OF STREAM | BY WHOM SURVEYED. | REMARKS. |
|--------------------------------|------------------------------|-----------------------|----------------------------------------|---------------------------------------|------------------------------------|----------------------------------|---------------------|-------------------|---------------------------------|
| Pickens County. | | | | | | | | | |
| <i>Longswamp Creek.</i> | Georgia Marble Works. | 24.94 | 2.83 | 2.20 | 28.20 | 22.60 | Low. | B. W. Frobel. | |
| <i>West Fork.</i> | Georgia Marble Works. | 72.00 | 1.34 | 1.00 | 13.60 | 10.90 | " | " | |
| <i>East Fork.</i> | Georgia Marble Works. | 12.94 | 1.47 | 1.17 | 14.70 | 11.70 | " | " | |
| Hall County. | | | | | | | | | |
| <i>Chattahoochee River</i> | Carter's Shoal. | 685.00 | 75.00 | 60.00 | 750.00 | 600.00 | Extreme Low. | " | |
| <i>Chattahoochee River</i> | Seven Islands. | 685.00 | 78.90 | 63.12 | 789.00 | 631.20 | " | " | |
| <i>Ory Creek.</i> | Near its mouth. | 2.60 | .28 | .22 | 2.80 | 2.20 | " | " | |
| <i>Limestone Creek.</i> | On Orr's land. | 8.16 | .93 | .74 | 9.30 | 7.40 | " | " | |
| <i>Little Flat element Cr.</i> | On Orr's land. | 2.60 | .28 | .22 | 2.80 | 2.20 | " | " | |
| <i>Red Creek.</i> | Near its mouth. | 5.00 | .57 | .45 | 5.70 | 4.50 | " | " | |
| <i>Flowers Creek.</i> | On Col. Spencer's land. | 4.83 | .64 | .43 | 6.40 | 4.30 | " | " | |
| <i>Big Creek.</i> | On Buford road. | 5.00 | .67 | .45 | 5.40 | 4.50 | " | " | |
| Gwinnett County. | | | | | | | | | |
| <i>Savannah Creek</i> | Sugar Hill road. | 10.82 | 1.24 | .99 | 12.40 | 9.90 | " | " | |
| <i>Jay Creek.</i> | Near its mouth. | 11.00 | 1.28 | 1.02 | 12.80 | 10.20 | " | " | |
| Fulton County. | | | | | | | | | |
| <i>Pool's Creek.</i> | At Pool's Mill. | 3.54 | .40 | .32 | 4.00 | 3.20 | " | " | |
| <i>Intrenchment Creek.</i> | Above Ormond's mill. | 6.00 | .68 | .54 | 6.80 | 5.44 | " | " | |
| <i>Griffin's Creek.</i> | Above Griffin's mill. | .80 | .09 | .07 | .90 | .70 | " | " | |
| <i>South River.</i> | At month Pool's Creek. | 7.38 | .83 | .60 | 8.30 | 6.64 | Spring Low. | " | About double extreme low. |
| DeKalb County. | | | | | | | | | |
| <i>Sugar Creek.</i> | At McNaught's mill. | 18.56 | 2.20 | 1.88 | 21.00 | 18.80 | Extreme Low | " | About double extreme low. |
| <i>Douglas Creek.</i> | At its mouth. | 4.31 | .49 | .39 | 4.90 | 3.90 | " | " | |
| <i>Shoal Creek.</i> | Atlanta and Flat Shoals road | 12.6 | 1.43 | 1.14 | 14.30 | 11.44 | " | " | |
| <i>Fork Creek.</i> | Near its mouth. | 6.21 | .70 | .58 | 7.00 | 5.60 | " | " | |
| <i>Swaninger Creek.</i> | At Mahew's gin. | 6.06 | .69 | .55 | 6.90 | 5.50 | " | " | |
| <i>South River.</i> | At Mitchell's mill. | 20.18 | 2.29 | 1.83 | 23.90 | 18.32 | " | " | |
| | At Flat Shoals. | 172.00 | 19.86 | 16.49 | 198.60 | 164.90 | Spring Low. | " | |
| Rockdale County. | | | | | | | | | |
| <i>Folsom Creek.</i> | Flat Shoals & Covington road | 14.72 | 1.66 | 1.22 | 18.50 | 12.20 | Very Low. | " | Head at Flat Shoals 24.38 feet. |
| <i>Honey Creek.</i> | Flat Shoals & Covington road | 14.42 | 1.64 | 1.21 | 16.40 | 12.10 | " | " | |

List of Water Powers Arranged by Counties.

| NAME OF STREAM | POINT OF SECTION. | Condition of stream. | Cubic feet per second | Fall in feet. | Length of shoal. | Width of stream. | Theoretical horse-power with one foot head. | Available horse-power with one foot head. | Difference between high and low water in feet. | Elevation surface of water above tide. | Distance from Georgia R. Bridge. | BY WHOM SURVEYED. | REMARKS. |
|----------------|---------------------|----------------------|-----------------------|---------------|------------------|------------------|---------------------------------------------|-------------------------------------------|------------------------------------------------|----------------------------------------|----------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Yellow River. | Bridge Shoal. | Minl. | 716. | 4.33 | 500 | 125 | 81.00 | 65.00 | ..... | 673. | 0. | U. S. river surveyers, B. W. Froebel, U. S. Civil Ass't Engineer. | The measurements given at Cedar Shoal include Steadman's shoal. At the dam river 290 ft. wide. At Steadman's mill dam river 700 ft. wide. The section and gauge was taken at Bridge shoal. Below this Turkey and Dried Indian Creeks, together with several minor streams, come in. Distances estimated from land lots and actual measurements. |
| Newton county | Cedar Shoal and. | num. | 716. | 62.66 | 4875 | 280 | 81.00 | 65.00 | ..... | ..... | 3.50 | U. S. Civil Ass't Engineer. | |
| Newton county | Steadman's Shoal. | Low. | 716. | 7.24 | 1500 | 700 | 81.00 | 65.00 | ..... | ..... | 6. | U. S. Civil Ass't Engineer. | |
| Newton county | Dried-Indian Shoal. | " | 716. | 3.97 | 1400 | 300 | 81.00 | 65.00 | ..... | ..... | 18. | " | |
| Newton county | Lee's Shoal. | " | 716. | 1.83 | 500 | 200 | 81.00 | 65.00 | ..... | ..... | 19. | " | |
| Newton county | Allen's Shoal | " | 716. | 12.28 | 400 | 300 | 81.00 | 65.00 | ..... | ..... | 21. | " | |
| Newton county | Indian Fishery | " | 716. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 22. | " | |
| Newton county | Mouth of River. | " | 716. | ..... | ..... | ..... | ..... | ..... | ..... | 613. | ..... | " |  |

List of Water Powers Arranged by Counties.

| NAME OF STREAM | POINT OF SECTION. | Condition of stream. | Cubic feet per second. | Fall in feet. | Length of shoal, feet. | Width of stream. | Theoretical horse-power with one foot head. | Available horse-power with one foot head. | Difference between high and low water in feet. | Elevation surface of water above tide. | Distance from Atlanta in miles. | BY WHOM SURVEYED. | REMARKS. |
|---------------------|---------------------------|------------------------------|------------------------|---------------|------------------------|------------------|---------------------------------------------|-------------------------------------------|------------------------------------------------|----------------------------------------|---------------------------------|-------------------|------------------------------------------------------------------------------------------------------------|
| South River..... | Atlanta Water-Works | Minimum low and high spring. | 46.21 | ..... | ..... | ..... | 6.22 | 4.18 | ..... | 8 7/8. | 4. | B. W. Frobelt, | Sections and gauges were had upon the river as low as |
| Fulton county ..... | ..... | ..... | 103.40 | ..... | ..... | ..... | 11.68 | 9.34 | ..... | ..... | 11. | " | Flat Shoals, and the volume of water in all streams emptying into South River as low as Peachstone Shoals. |
| DeKalb county | Hinley's Mill..... | ..... | 73.42 | ..... | ..... | ..... | 8.29 | 6.63 | ..... | ..... | ..... | " | From these measurements other points have been estimated. |
| DeKalb county | Flat Shoals..... | ..... | 172.23 | 24 36 | ..... | ..... | 19.44 | 15.36 | ..... | ..... | 16. | " | |
| Henry county | McKnight's Mill..... | ..... | 92.23 | ..... | ..... | ..... | 10.42 | 8.33 | ..... | ..... | ..... | " |  |
| Henry county ..... | ..... | ..... | 219 | 12.00 | ..... | ..... | 24.75 | 19.80 | ..... | ..... | 27. | " | |
| Henry county | Peachstone Shoal..... | ..... | 120.71 | 12 00 | ..... | ..... | 13.64 | 10.91 | ..... | ..... | 34. | " | |
| Newton county ..... | ..... | ..... | 283. | ..... | ..... | ..... | 31.18 | 24.94 | ..... | ..... | ..... | " |  |
| Newton county | Snapping Shoals..... | ..... | 440. | ..... | ..... | ..... | 49.72 | 37.78 | ..... | ..... | 43. | " | |
| Newton county ..... | ..... | ..... | 1002. | ..... | ..... | ..... | 113.28 | 90.58 | ..... | ..... | ..... | " |  |
| Newton county | Hartfield's Mill..... | ..... | 589. | ..... | ..... | ..... | 60.91 | 48.73 | ..... | ..... | 49. | " | |
| Newton county ..... | ..... | ..... | 1270. | ..... | ..... | ..... | 143.51 | 114.81 | ..... | ..... | ..... | " |  |
| Newton county | Month Yellow River ..... | ..... | 658. | ..... | ..... | ..... | 74.35 | 69.46 | ..... | ..... | 52. | " | |
| Newton county ..... | ..... | ..... | 1314. | ..... | ..... | ..... | 148.49 | 118.79 | ..... | ..... | ..... | " |  |

List of Water Powers Arranged by Counties.

| NAME OF STREAM | POINT OF SECTION. | Condition of stream. | Cubic feet per second. | Fall in feet. | Length of shoal, feet | Width of stream, feet | Theoretical horse-power with one foot head. | Available horse-power with one foot head. | Difference between high and low water in feet. | Elevation surface of water above tide in feet. | Distance from mouth of Yellow river, miles | BY WHOM SURVEYED. | REMARKS. |
|-------------------|----------------------|----------------------|------------------------|---------------|-----------------------|-----------------------|---------------------------------------------|-------------------------------------------|------------------------------------------------|------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------|--------------------------|
| mulgee River..... | Barnes Shoal | Mini-mum. | 1416. | 11.65 | 500 | 500 | 160. | 128.64 | .. | 513 | 0. | U. S. river surveyers, B. W. Froebel, U. S. Civil Asset Engineer. | |
| per county..... | Lemon Shoal | " | 1416. | 2.80 | 700 | 300 | 160. | 128.64 | .. | .. | 3. | | |
| per county..... | Cap's Shoal | " | 2166. | 6.59 | 400 | 375 | 244.75 | 195.80 | .. | .. | 5. | | |
| per county..... | Lloyd's Shoal | Low. | 2166. | 39.63 | 9500 | 400 | 244.75 | 195.80 | .. | .. | 6. | | |
| per county..... | Pitman's Shoal | " | 2166. | 3.51 | 1800 | 425 | 244.75 | 195.80 | .. | .. | 9. | | |
| per county..... | Ronache's Shoal | " | 2166. | 7.50 | 3900 | 300 | 244.75 | 195.80 | .. | .. | 12. | | |
| per county..... | Lamar's Shoal | " | 2166. | 3.95 | 1800 | 425 | 244.75 | 195.80 | .. | .. | 13. | | |
| per county..... | Seven Islands | " | 2960. | 19.52 | 1600 | 300 | 555.38 | 204.30 | .. | .. | 14. | | |
| per county..... | Long Shoals. | " | 2917. | 11.32 | 1600 | 500 | 823.61 | 263.70 | .. | .. | 24. | | |
| per county..... | Falling Creek Shoals | " | 2917. | 1.37 | 3200 | 400 | 823.61 | 263.70 | .. | .. | 34. | | |
| per county..... | Dames Shoals | " | 2917. | 3.64 | 500 | 325 | 823.61 | 263.70 | .. | .. | 35. | | |
| per county..... | Taylor's Shoal | " | 2917. | 5.73 | 2100 | 400 | 823.61 | 263.70 | .. | .. | 36. | | |
| per county..... | Harris Shoal | " | 2917. | 2.81 | 3000 | 300 | 823.61 | 263.70 | .. | .. | 37. | | |
| per county..... | Johnson's Shoal | " | 2917. | 5.13 | 1500 | 450 | 823.61 | 263.70 | .. | .. | 37.50 | | |
| per county..... | Ho'man's Shoal | " | 2917. | 1.29 | 1400 | 400 | 823.61 | 263.70 | .. | .. | 39. | | |
| per county..... | Holt's Shoal | " | 2917. | 3.72 | 400 | 300 | 823.61 | 263.70 | .. | .. | 40. | | |
| per county..... | Macon | " | .. | .. | .. | .. | .. | .. | .. | .. | 273.46. | | Central Railroad Bridge. |

List of Water-Powers Arranged by Counties.

| LOCATION OF WATER-POWER. | POINT OF SECTION. | Condition of stream. | Cubic feet per second. | Fall in feet. | Theoretical horse-power, one foot fall. | Available horse-power, one foot fall. | Length of shoal. | Width of stream, in feet. | Difference between high and low water, in feet. | Elevation above tide. | Distance from Angus Sta. in miles | BY WHOM SURVEYED. | REMARKS. |
|--------------------------|------------------------------|----------------------|------------------------|---------------|-----------------------------------------|---------------------------------------|------------------|---------------------------|-------------------------------------------------|-----------------------|-----------------------------------|------------------------------------------------------|----------|
| <i>Sacannah River.</i> | | | | | | | | | | | | U. S. River Surveyers. J. P. Carson, Ass't Engineer. | |
| Columbia county... | Angusta. | Minimum | 2775. | 85.00 | 803.57 | 242.86 | 5 m's | 1800 | 39. | 148. | 0.00 | | |
| Lincoln county... | Long Shoal. | Low. | 2400 | 74.88 | 271.20 | 216.96 | 7 m's | 2400 | 16. | ... | 29.50 | | |
| Elbert county... | Trotter's Shoal. | " | 2150. | 9.00 | 242.95 | 194.36 | 2640 ft | 1800 | 10. | ... | 64.00 | | |
| Elbert county... | Cherokee Shoal. | " | 2160 | 3.00 | 237.80 | 189.84 | 120 ft | 600 | ... | ... | 75.50 | | |
| Elbert county... | Bowman's Ledge. | " | 2000. | 14.00 | 226.00 | 180.80 | 5280 ft | 1350 | ... | ... | 83.00 | | |
| Elbert county... | Gregg's Shoal. | " | 1874. | 18.00 | 211.76 | 169.41 | 6280 ft | 2100 | ... | ... | 85.50 | | |
| Elbert county... | Middleton Shoal. | " | 1750. | 3.00 | 197.75 | 158.20 | 860 ft | 960 | ... | ... | 88.50 | | |
| Elbert county... | Ferrell's Ledge. | " | 1750. | 2.50 | 197.75 | 158.20 | 900 ft | 900 | ... | ... | 89.75 | | |
| Elbert county... | Wall's Ledge. | " | 1725. | 30.00 | 194.92 | 155.93 | 5 m's | 1500 | ... | ... | 91.50 | | |
| Hart county... | McDaniel's Shoal. | " | 1650. | 3.00 | 186.46 | 143.16 | 1340 ft | 760 | ... | ... | 95.50 | | |
| Hart county... | Fork Shoal. | " | 1650. | 3.00 | 186.46 | 143.16 | 1340 ft | 760 | ... | ... | 107.25 | | |
| <i>Tugalo River.</i> | | | | | | | | | | | | | |
| Hart county... | Hutton Shoal. | " | 1150 | 39.00 | 129.95 | 103.96 | 1.5 m's | 1500 | ... | ... | 110.00 | | |
| Hart county... | Shoal. | " | 1150. | 4.00 | 129.95 | 103.96 | 1800 ft | 800 | ... | ... | 113.00 | | |
| Hart county... | Guest's Shoal. | " | 1150. | 22.50 | 139.89 | 103.96 | 6220 ft | 1200 | ... | ... | 113.50 | | |
| Franklin county... | Stribling Shoal. | " | ... | 2.60 | ... | 2640 ft | ... | 800 | ... | ... | 130.50 | | |
| Franklin county... | Easton's Shoal. | " | ... | 4.00 | ... | 2640 ft | ... | 750 | ... | ... | 131.00 | | |
| Franklin county... | A. & C. Air-Line R.R. Bridge | " | 754. | 85.20 | 88.16 | ... | ... | ... | ... | ... | 141.00 | | |
| Habersham county... | Head of navigation. | " | ... | ... | ... | ... | ... | ... | ... | ... | 144.00 | | |
| Habersham county... | Mouth Tallulah River. | " | 654 | 75.00 | 73.90 | 58.12 | 2.5 m's | 225 | ... | ... | 156.50 | | |

A Partial List of the Water Powers in Georgia, with Descriptions, arranged by Counties.

Re-printed from the Hand-Book of Georgia.

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second. | Theoretical horse-power of one-foot head. | Available horse-power of one-foot head. | Approximate head of an assumed head of 10 feet. | Theoretical power of stream with this head running 24 hours. | Available power of stream with this head working 24 hours of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|-----------------------|---------------------------------|------------------------|-------------------------------------------|-----------------------------------------|-------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------|----------------------|-------------------|-------------------------------|
| BANKS COUNTY. | | | | | | | | | | |
| Broad River..... | Habersham Line..... | 27.20 | 3.10 | 2.48 | 10.00 | 31.00 | 24.80 | Low water or more. | Barrow & Locke | |
| Grove River..... | Homer and Mt. Airy Road..... | 65.60 | 7.41 | 5.92 | 10.00 | 74.10 | 59.20 | Low water or more. | Locke. | |
| Hudson River..... | Homer and Mt. Airy Road..... | 77.40 | 8.58 | 6.86 | 10.00 | 85.81 | 68.61 | " " | Locke. | |
| BARTOW COUNTY. | | | | | | | | | | |
| Oothcaloga Creek. | Gordon Line..... | 15.00 | 1.70 | 1.36 | 6.00 | 10.20 | 8.16 | Minimum low water. | Locke. | Water very low. |
| " | Adairsville..... | 7.00 | .79 | .63 | 6.00 | 5.36 | 4.27 | " " | " | " " |
| Lewis Spring.. | Near Adairsville..... | 8.00 | .80 | .64 | 10.00 | 9.12 | 7.3 | " " | " | " " largest spring in county. |
| Cedar Spring..... | Martello's Mill..... | 2.50 | .28 | .22 | 18.00 | 5.10 | 4.0 | " " | " | Water very low. |
| Cedar Creek..... | Gordon Line..... | 8.00 | .80 | .64 | 12.00 | 11.00 | 8.0 | " " | " | " " |
| Fork of Pine Log | McCanless and Parrott Mill..... | 18.00 | 2.04 | 1.36 | 20.00 | 41.00 | 32.8 | " " | " | " " |
| Fork of Pine Log | Johnson's Mill..... | 14.00 | 1.60 | 1.28 | 15.00 | 24.00 | 19.2 | " " | " | Estimated. |
| Silacoa Creek..... | Gordon Line..... | 20.00 | 2.27 | 1.81 | 20.00 | 45.60 | 36.5 | " " | " | Very low. |
| Stamp Creek..... | Pool's Furnace..... | 12.00 | 1.34 | 1.07 | 20.00 | 27.3 | 22.0 | " " | " | " " |
| " | At Mouth..... | 24.00 | 2.68 | 2.14 | 20.00 | 54.4 | 43.7 | " " | " | " " |
| Boston's Creek..... | At Mouth..... | 4.00 | .45 | .36 | 20.00 | 9.2 | 7.3 | " " | " | " very rapid fall |

| Rogers Creek..... | At mouth..... | 7.00 | -79 | 63 | 29.00 | 16.00 | 13.00 | Low water. | Locke. |
|--------------------|---------------------------|---------|--------|--------|-------|---------|---------|------------|------------|
| | | | | | | | | | |
| Etowah River | At m'th of Allatoona..... | 1307.7 | 147.68 | 118.14 | 15.00 | 2250 00 | 1835.00 | Minimum | " |
| Pettis Creek..... | Mouth | 20.00 | 2.67 | 2.13 | 5.00 | 12.00 | 9.60 | low water. | " |
| Nancy Creek..... | " | 6.00 | .68 | .50 | 5.00 | 3.00 | ..... | " | " |
| Two-Run Creek... | Kingston..... | 26.00 | 2.94 | 2.3 | 16.00 | 48.00 | 38.40 | Minimum | Very low. |
| Coascena Creek... | " | 5.00 | .55 | .44 | 20.00 | 11.00 | 9.10 | Low water. | " |
| Bareley's Creek... | Near mouth..... | 5.00 | .55 | .44 | 18.00 | 10.00 | 8.2 | " | " |
| Allatoona Creek... | 2½ miles from mouth | 25.5 | 28.50 | 22.80 | 17.00 | 48.4 | 38.8 | " | " |
| Pumpkinvine C'k. 2 | " | 70.00 | 7.95 | 6.41 | 10.00 | 80.00 | 64.0 | " | " |
| Raccoon Creek.... | 1 " | 39.00 | 4.54 | 3.63 | 10.00 | 45.60 | 36.5 | " | " |
| Euharlee..... | 2 " | 120.90 | 13.51 | 10.81 | 12.00 | 165.6 | 132.8 | " | " |
| BIBB COUNTY. | | | | | | | | | |
| Ocmulgee River... | Holt's Shoals..... | 2917.00 | 331.37 | 265.09 | 3.70 | 1224.70 | 979.76 | " | Frobel. |
| Walnut Creek..... | Macon | 5.00 | 0.37 | 0.5 | 10.00 | 5.70 | 4.50 | " | Locke. |
| Swift Creek..... | 7 miles, Macon..... | 5.00 | 0.57 | 0.45 | 10.00 | 5.70 | 4.50 | " | " |
| Stone Creek..... | 8 " | 8.00 | 0.91 | 0.72 | 12.00 | 10.92 | 8.73 | " | " |
| Tobesofkee Creek | Freeman's Mill..... | 70.00 | 7.98 | 6.38 | 20.00 | 159.60 | 127.68 | Above | " |
| BURKE COUNTY. | | | | | | | | | |
| McBean's Creek... | Waynesborough R. R... | 50.00 | 5.70 | 4.56 | 10.00 | 570.00 | 456.00 | " | Barrow. |
| Boggy Gut Creek... | Shel Bluff..... | 10.00 | 1.14 | 0.91 | 10.00 | 10.40 | 9.10 | " | " |
| Sapp's Spring C'k | Sapp's Mill..... | 20.00 | 2.28 | 1.82 | 11.00 | 25.08 | 20.06 | " | " |
| CARROLL COUNTY. | | | | | | | | | |
| Buffalo Creek..... | 1½ ms. S. of Carrollton | 6.00 | 0.68 | 0.54 | 10.00 | 6.80 | 5.40 | " | Locke. |
| Briar Creek..... | 3 miles, Carrollton... | 5.00 | 0.56 | 0.44 | 10.00 | 5.60 | 4.40 | " | " |
| Panther Creek..... | 4½ " | 4.00 | 0.45 | 0.36 | 10.00 | 4.50 | 3.60 | " | " |
| Buffalo Creek..... | 1 mile above mouth... | 18.00 | 2.04 | 1.64 | 10.00 | 20.40 | 16.40 | " | Estimated. |

A Partial List of the Water-Powers in Georgia, etc.—(Continued.)

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second. | Theoretical horse-power of 1-foot head. | Available horse-power of one-foot head. | Approximate head or an assumed head of 10 feet. | Theoretical power of stream with this head running 24 hours. | Available power of stream with this head working 24 hrs. of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|--------------------|------------------------------------|------------------------|-----------------------------------------|-----------------------------------------|-------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|----------------------|-------------------|--------------------------------------|
| CARROLL Co.—Cont'd | | | | | | | | | | |
| Snake Creek..... | Factory | 42.00 | 4.70 | 3.76 | 30.00 | 141.00 | 112.80 | Low spring. | Locke. | 100 or more feet of head can be had. |
| Dog River..... | Above Watkins' Mill.. | 25.76 | 2.92 | 1.60 | 10.00 | 29.20 | 16.00 | " | " | Measurement unsatisfactory. |
| Cockrum's Creek.. | Old Cherokee and Carroll line..... | 4.5 | .60 | .48 | 10.00 | 6.00 | 4.80 | " | " | Estimated. |
| Tallapoosa | Above m'th Buck Crk | 101.43 | 17.42 | 9.13 | 10.00 | 114.20 | 91.30 | " | " | |
| Buck Creek..... | South of Tallapoosa | 16.60 | 1.81 | 1.45 | 10.00 | 18.10 | 14.50 | " | " | |
| Indian Creek..... | and near Bonner's... | 7.00 | .79 | .64 | 10.00 | 7.91 | 6.40 | " | " | Estimated. |
| Whooping Creek... | Dorris Mill..... | 24.50 | 2.72 | 2.17 | 10.00 | 27.20 | 21.70 | Flush or less. | " | |
| CHATTAHOOCHEE Co.. | | | | | | | | | | |
| Oewitchee Creek... | Bagley's Mill..... | 6.00 | 0.70 | 0.56 | 18.00 | 12.60 | 10.08 | Low spring. | " | |
| " | Romney's Mill..... | 21.00 | 2.28 | 1.82 | 18.00 | 33.04 | 24.43 | " | " | |
| Woolfolk's Bra'ch | Woolfolk's | 1.00 | 0.11 | 0.08 | 65.00 | 7.15 | 5.72 | " | " | |
| Upatoi | | | | | 12.00 | | | | | Very sandy and full. |
| CHATTOOGA Co. | | | | | | | | | | |
| Little Turtle Crk. | Near mouth..... | 5.5 | 0.62 | 0.49 | 10.00 | 6.20 | 4.90 | | Barrow. | |

| | | | | | | | | |
|---------------------------------------------------------------------------------------------------|-------------------------------------------|---------|--------|--------|-------|---------|---------|---------------------------------|
| Raccoon Creek..... | Lot 39..... | 4.5 | 0.51 | 0.40 | 10.00 | 5.10 | 4.00 | Barrow. |
| Rough Creek..... | Mouth..... | 8.8 | 1.00 | 0.80 | 10.00 | 10.00 | 8.00 | " |
| Armuchee Creek..... | Subsigna..... | 41.5 | 4.73 | 3.78 | 10.00 | 4.73 | 3.78 | " |
| CHEROKEE COUNTY. | | | | | | | | |
| Mill Creek..... | Mouth at Canton..... | 46.00 | 5.22 | 4.17 | 10.00 | 52.20 | 41.70 | Low spring.
or more. |
| CLAY COUNTY. | | | | | | | | |
| Chemochechobee.. | Weaver's Mill | 60.00 | 6.84 | 5.47 | 30.00 | 205.20 | 164.16 | Cubic feet estimated. |
| Pataula | Rapids | 240.00 | 27.36 | 21.88 | 22.00 | 601.92 | 481.53 | |
| CLINCH COUNTY. | | | | | | | | |
| Suwannee River... | Mixon's Ferry..... | 72.00 | 7.95 | 6.38 | 10.00 | 79.5 | 63.80 | Minimum
low water. |
| COBB COUNTY. | | | | | | | | |
| Big or Vickery's
Creek | Empire Mill..... | 147. | 16.76 | 13.4 | 16.0 | 268.1 | 214.52 | Low water. |
| " | " | 147. | 16.76 | 13.40 | 30.00 | 502.80 | 402.24 | Col. Ro-
binson,
R. M. Co |
| " | " | 147. | 16.76 | 13.40 | 14.00 | 234.6 | 187.7 | " |
| Head of Nickajack | Jones' Mills..... | 3.00 | 0.34 | 0.27 | 15.00 | 5.10 | 4.08 | " |
| Nickajack | Ruff's Mill's..... | ..... | ..... | ..... | 29.00 | ..... | ..... | Locke. |
| " | Concord Factory..... | ..... | ..... | ..... | 21.00 | ..... | ..... | " |
| " | Concord Factory and
Ruff's Mill comb'd | | | | 50.00 | | | " |
| Chatahoochee | Austell's Shoals..... | 2000.00 | 226.20 | 180.96 | 10.00 | 2262.00 | 1809.60 | " |
| Tributary Sweet-
Water..... | Babb's Mill..... | 2.00 | 0.23 | 0.18 | 18.0 | 4.14 | 3.32 | " |
| Rotter. Wood..... | Aker's Mill..... | 35.00 | 3.97 | 3.17 | 32.0 | 127.24 | 100.78 | " |
| " | Boring's Mill..... | 38.00 | 4.30 | 3.44 | 10.00 | 43.00 | 34.40 | Low Water. |
| " | " | ..... | ..... | ..... | ..... | ..... | ..... | Low spring. |
| } Too full for meas-
urement; has proba-
bly 20 cubic feet at
low water.
} Estimated. | | | | | | | | |
| } Almost any head to 50
obtainable. | | | | | | | | |

Too full for meas-
urement; has proba-
bly 20 cubic feet at
low water.
Estimated.

Almost any head to 50
obtainable.

A Partial List of the Water-Powers in Georgia, Etc.—(Continued.)

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second. | Theoretical horse-power of one foot head. | Available horse-power of one foot head. | Approximate head of 10 feet. | Theoretical power of stream with this head running 24 hours. | Available power of stream with this head working 24 hours of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|---------------------------|----------------------------------|------------------------|-------------------------------------------|-----------------------------------------|------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------|----------------------|-------------------|---------------------------------|
| <i>COBB Co.—Continued</i> | | | | | | | | | | |
| Soap Creek..... | At Paper Mill..... | 62.00 | 7.40 | 5.92 | 67.00 | 495.8 | 396.64 | Low spring. | Locke. | Head includes Robertson's Mill. |
| Little Willico..... | Old Starch Factory..... | 5.00 | .57 | .45 | 5.50 | 11.40 | 9.00 | " | " | There are 2 L. Willicos. |
| " | At mouth, Willico Factory..... | 8.00 | .908 | .72 | 30.00 | 27.00 | 21.60 | " or more | " | " |
| Willico | Above Factory..... | 21.60 | 2.45 | 1.96 | 31.00 | 75.96 | 60.72 | Low spring. | " | " |
| Powder Spring Ck..... | Powder Spring..... | 34.00 | 3.96 | 3.17 | 10.00 | 39.60 | 31.70 | " | " | " |
| Sweet Water..... | Hays' Bridge..... | 80.50 | 9.09 | 7.20 | 10.00 | 90.00 | 72.00 | Low water. | " | " |
| <i>COLUMBIA COUNTY.</i> | | | | | | | | | | |
| Kiokee Creek..... | Near Appling..... | 30.00 | 3.42 | 2.73 | 10.00 | 34.20 | 27.30 | | Barrow. | |
| <i>DAWSON COUNTY.</i> | | | | | | | | | | |
| Etowah River..... | Palmer's Mill..... | 60.25 | 6.87 | 5.29 | 10.00 | 48.70 | 52.90 | | " | |
| Shoal Creek..... | Howzer's Mill..... | 33.00 | 3.76 | 2.86 | 16.00 | 60.16 | 48.12 | | " | |
| Amicolala River.. | Dawsonville and Jasper Road..... | 103.60 | 11.80 | 9.44 | 51.00 | 590.00 | 472.00 | | " | |
| " | 8 miles Dawsonville .. | 85.00 | 9.69 | 7.75 | 10.00 | 96.96 | 77.50 | | " | |
| Head of Jones' Creek..... | Foster's Mill | 2.00 | 0.23 | 0.18 | 14.00 | 3.19 | 2.55 | | " | |

| DECATUR COUNTY. | | | | | | | | | | | | |
|------------------------------------|-------|-------|-------|--------|-------|--------|-------------|---------|---------------------------------------------------------------------------------------------------|--|--|--|
| Limesink..... | 2.00 | 0.23 | 0.18 | 105.00 | 24.15 | 19.32 | Low spring. | Locke. | Creek disappears. Pro-
bably has more water.
Flow affected by mills
above.
Estimated. | | | |
| Barnett's Creek... | 23.00 | 2.62 | 2.09 | 10.00 | 26.20 | 20.90 | " | " | | | | |
| Atapulgus Creek | 18.00 | 2.05 | 1.64 | 10.00 | 20.50 | 16.40 | " | " | | | | |
| Martin's Mill Crk | 5.00 | 0.57 | 0.45 | 7.00 | 3.99 | 3.19 | " | " | | | | |
| Sanburn's Mill Crk | 8.00 | 0.91 | 0.72 | 10.00 | 9.10 | 7.20 | " | " | | | | |
| | | | | | | | | | | | | |
| DEKALB COUNTY. | | | | | | | | | | | | |
| Peachtree Creek... | 23.75 | 2.71 | 2.16 | 22.0 | | | Low water. | " | Estimated. | | | |
| | | | | | | | | | | | | |
| EARLY COUNTY. | | | | | | | | | | | | |
| Harrod's Creek... | 20.00 | 2.28 | 1.82 | 35.00 | 79.80 | 63.84 | Low spring. | " | Estimated. | | | |
| Colomochee Creek | 70.00 | 7.98 | 6.38 | 12.00 | 95.76 | 75.60 | | | | | | |
| ELBERT COUNTY. | | | | | | | | | | | | |
| Beaver Dam Crk... | 30.00 | 3.42 | 2.73 | 10.00 | 34.20 | 27.30 | | Barrow. | Stream little above l.w. | | | |
| | | | | | | | | | | | | |
| FLOYD COUNTY. | | | | | | | | | | | | |
| Armucbee Creek... | 135. | 15.40 | 12.32 | 10.00 | 154.0 | 121.04 | Low water. | Locke. | | | | |
| Lit. Fork Armu-
chee Creek..... | 41. | 4.67 | 3.73 | 15.00 | 71.1 | 55.95 | " | " | | | | |
| Big Fork Armu-
chee Creek..... | 48. | 5.47 | 4.37 | 10.00 | 54.7 | 43.7 | " | " | | | | |
| John's Creek..... | 15. | 1.71 | 1.36 | 8.00 | 13.6 | 10.88 | " | " | | | | |
| Silver Creek..... | 24. | 2.73 | 2.18 | 18.0 | 49.2 | 39.24 | " | " | | | | |
| Cedar Creek..... | 70. | 8.00 | 6.40 | 10.0 | 79.8 | 64.0 | Minimum | " | | | | |
| Little Cedar Creek | 20. | 2.28 | 1.82 | 14.0 | 31.9 | 25.50 | low water | " | | | | |
| " " Cave Spring..... | 60.80 | 6.92 | 5.54 | 10.00 | 69.20 | 55.41 | Low spring | " | | | | |
| Big Spring..... | 7.98 | .90 | .786 | 10.00 | 9.08 | 7.86 | Low spring. | " | | | | |

A Partial List of the Water-Powers in Georgia, Etc.—(Continued.)

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second. | Theoretical horse-power of one foot head. | Available horse-power of one foot head. | Approximate head, or 10 feet. | Theoretical power of stream with this head running 24 hours. | Available power of stream with this head working 24 hours of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|-------------------------|----------------------------------|------------------------|-------------------------------------------|-----------------------------------------|-------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------|----------------------|-------------------|------------|
| FORSYTH COUNTY. | | | | | | | | | | |
| Beaver Run..... | Mouth..... | 75.00 | 8.55 | 6.84 | 20.00 | 171.00 | 136.80 | Flush. | Barrow. | |
| Sitting-Down Crk | Holbrook's Mill..... | 30.00 | 3.42 | 2.73 | 7.00 | 23.94 | 19.15 | | " | |
| Etowah River..... | Franklin Mines..... | 1129.00 | 128.70 | 102.96 | 8.00 | 1029.00 | 823.20 | Low spring. | " | |
| Sitting-Down Crk | Pool and Heard's Mill | 30.00 | 3.42 | 2.73 | 15.00 | 51.70 | 41.36 | | | |
| FRANKLIN COUNTY | | | | | | | | | | |
| Broad River..... | Toccoa and Carnesville Road..... | 50.00 | 5.70 | 4.56 | 10.00 | 57.00 | 45.60 | | " | |
| Creek..... | 3 miles Carnesville.... | 2.00 | 0.23 | 0.18 | 16.00 | 3.65 | 2.92 | | " | |
| Unawattee..... | 4 "..... | 50.00 | 5.70 | 4.56 | 10.00 | 57.00 | 45.60 | | " | |
| FULTON COUNTY. | | | | | | | | | | |
| Peachtree..... | Atlanta and Buckhead Road..... | 97.50 | 11.07 | 8.85 | | | | Flush or lower. | Locke. | |
| Nancy's Creek..... | 16 and 17..... | 45.00 | 5.01 | 4.01 | | | | Low spring. | " | Estimated. |
| Marsh Creek..... | 13 and 17..... | 5.00 | 0.57 | .45 | | | | " | " | |
| Long Island Creek | 164 and 17..... | 6.5 | .73 | .58 | | | | | | |
| GLASCOCK COUNTY. | | | | | | | | | | |
| Sock's Branch..... | 4outh..... | 6.00 | 0.68 | 0.54 | 18.00 | 12.31 | 9.84 | | | |

A Partial List of the Water-Powers in Georgia, Etc.—(Continued.)

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second. | Theoretical horse-power of one-foot head. | Available horse-power of one foot head. | Approximate head or 10 feet. | Theoretical power of stream with this head running 24 hours. | Available power of stream with this head working 24 hours of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|------------------------------|----------------------------|------------------------|-------------------------------------------|-----------------------------------------|------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------|----------------------|-------------------|----------------|
| HABERS'AM Co.—Cont | | | | | | | | | | |
| Panther Creek..... | Weaver's Mill..... | 19.37 | 2.22 | 1.76 | 30.00 | 66.66 | 52.22 | Low water. | Barrow | Falls rapidly. |
| Rock Hazel Creek..... | Jackson's Mill..... | 3.00 | 0.34 | 0.27 | 20.00 | 6.80 | 5.40 | " | " | " |
| Mud Hazel Creek..... | Near mouth..... | 8.85 | 1.00 | 0.80 | 10.00 | 10.00 | 8.00 | " | " | " |
| Little Mud Creek..... | ½ mile Hall Line..... | 33.00 | 3.76 | 3.00 | 10.00 | 37.60 | 30.00 | Above l. w. | " | " |
| Big Mud Creek..... | " " " "..... | 20.00 | 2.28 | 1.82 | 10.00 | 22.80 | 18.20 | " | " | " |
| Ward's Creek..... | Jarrett's Mill..... | 33.75 | 3.76 | 2.86 | 10.00 | 37.60 | 28.60 | Flush. | " | " |
| Toccoa Creek..... | Toccoa Falls..... | 5.20 | 0.60 | 0.48 | 190.00 | 114.00 | 91.20 | Low spring. | " | " |
| Roper's Creek..... | Willbank's Store..... | 5.00 | 0.57 | 0.45 | 10.00 | 5.70 | 4.50 | " | " | " |
| Soquee River..... | Hill's Mill..... | 41.04 | 4.60 | 3.68 | 40.00 | 184.00 | 147.20 | " | " | " |
| Sutton's Mill Cr'k..... | Near Clarkesville..... | 16.80 | 2.00 | 1.60 | 10.00 | 20.00 | 16.00 | " | " | " |
| Deep Creek..... | Near mouth..... | 38.50 | 4.39 | 3.51 | 10.00 | 43.90 | 35.10 | " | " | " |
| Creek..... | Near Batesville..... | 3.00 | 0.34 | 0.27 | 9.00 | 3.07 | 2.45 | " | " | " |
| Mathews' Mill C'k Mouth..... | " " " "..... | 1.50 | 0.17 | 0.13 | 22.80 | 3.76 | 2.86 | " | " | " |
| Panther Creek..... | Walker's Mill..... | 4.50 | 0.51 | 0.40 | 20.00 | 10.26 | 8.20 | " | " | " |
| Nancy Town Cr'k..... | At mouth of Cox's C'k..... | 5.29 | 0.60 | 0.48 | 10.00 | 6.00 | 4.80 | " | " | " |
| Cox's Creek..... | Near mouth..... | 2.00 | 0.22 | 0.17 | 100.00 | 22.00 | 17.60 | " | " | " |
| Nancy Town Cr'k..... | Above Stack's Branch..... | 2.80 | 0.32 | 0.25 | 15.00 | 4.78 | 3.82 | " | " | " |
| Dick's Creek..... | Hulsey's Mill..... | 3.32 | 0.37 | 0.29 | 30.00 | 11.30 | 9.04 | " | " | " |
| Leatherwood Cr'k..... | Hickery's Mill..... | 0.75 | 0.08 | 0.06 | 14.00 | 1.20 | 0.96 | " | " | " |

| | | | | | | | | |
|------------------------------|---------------------------------------------|--------|--------|-------|-------|---------|--------|-------------|
| Walton's Creek.... | Jarrett's Bridge Road. | 5.10 | 0.58 | 0.46 | 10.00 | 5.80 | 4.60 | Barrow. |
| Tocoa Creek..... | At mouth..... | 16.00 | 1.82 | 1.45 | 10.00 | 18.20 | 14.50 | " |
| Black Mountain
Creek..... | Near mouth..... | 1.25 | 0.14 | 0.11 | 10.00 | 1.40 | 1.10 | " |
| Panther Creek..... | " | 53.63 | 6.11 | 4.88 | 10.00 | 61.10 | 48.80 | " |
| HALL COUNTY. | | | | | | | | |
| Chestatee | Leather's Ford..... | 290.00 | 33.00 | 26.40 | 12.00 | 396.00 | 316.80 | " |
| Yellow Creek | Near mouth..... | 7.28 | 0.83 | 0.66 | 20.00 | 16.60 | 13.28 | " |
| Big Wahoo Creek. | Glade Mine and Leath-
erwood Ford Road.. | 14.57 | 1.66 | 1.32 | 10.00 | 16.60 | 13.20 | " |
| Middle Wahoo
Creek..... | Glade Mine and Leath-
erwood Ford Road.. | 12.47 | 1.42 | 1.13 | 10.00 | 14.20 | 11.30 | " |
| Little River..... | Glade Mine and Leath-
erwood Ford Road.. | 12.64 | 1.44 | 1.15 | 10.00 | 14.40 | 11.50 | " |
| Flat Creek..... | Above Glade Mine.... | 17.82 | 1.97 | 1.57 | 50.00 | 98.50 | 78.80 | " |
| Chattahoochee
River..... | Shallow Ford | 929.00 | 106.00 | 84.80 | 10.00 | 1060.00 | 848.00 | " |
| North Fork Oco-
nee | Snubur Springs..... | 22.37 | 2.54 | 2.03 | 10.00 | 25.40 | 20.30 | " |
| North Fork Oco-
nee | Carnesville & Gaines-
ville Road | 31.50 | 3.59 | 2.87 | 10.00 | 35.90 | 28.70 | " |
| Candler's Creek... | Carnesville & Gaines-
ville Road | 9.60 | 1.10 | 0.88 | 10.00 | 10.9 | 8.80 | " |
| Piggon-Wing Cr'k | Mouth..... | 2.00 | 0.23 | 0.18 | 16.00 | 2.30 | 1.80 | " |
| Caney Fork | County Line..... | 12.00 | 1.37 | 1.11 | 10.00 | 13.70 | 11.10 | " |
| Walnut Fork..... | Harrington's Ford.... | 15.54 | 1.77 | 1.41 | 20.00 | 35.40 | 28.32 | " |
| Holly Branch..... | Mouth..... | 2.50 | 0.28 | 0.22 | 12.00 | 3.42 | 2.73 | " |
| Rocky Shoal Cr'k. | Mouth..... | 2.00 | 0.23 | 0.18 | 10.00 | 2.30 | 1.80 | " |
| Allen's Fork..... | County Line..... | 22.52 | 2.56 | 2.04 | 10.00 | 25.60 | 20.40 | " |
| Pond Fork..... | Margum's Mill..... | 10.58 | 1.20 | 0.96 | 9.00 | 10.80 | 8.64 | " |
| HARALSON COUNTY. | | | | | | | | |
| Tallapoosa..... | Waldrop's..... | 49.80 | 5.60 | 4.48 | 10.00 | 56.00 | 44.80 | Low spring. |
| " | McBride's Bridge.... | 586.80 | 66.56 | 53.24 | 10.00 | 66.56 | 53.24 | Above " |
| " | Lathrom's Crossing... | 105.60 | 11.92 | 9.53 | 10.00 | 119.2 | 95.30 | " |

A Partial List of the Water-Powers in Georgia, Etc.—(Continued.)

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second | Theoretical horse power of one foot head. | Available horse-power or one-foot head. | Approximate head of an assumed head of 10 feet. | Theoretical power of stream with this head running 24 hrs. | Available power of stream with this head working 24 hours of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|--------------------|------------------------|-----------------------|-------------------------------------------|-----------------------------------------|-------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------|----------------------|-------------------|----------------------------------------------------------------------------------------|
| HARALSON Co.—Cont | | | | | | | | | | |
| Little River..... | Mouth | 19.48 | 2.22 | 1.77 | 10.00 | 22.20 | 17.70 | Above 1. sp. | | A 30 foot dam would flood 70 acres or more. |
| Beach Creek..... | Rock House..... | 30.50 | 3.31 | 2.64 | 10.00 | 33.10 | 26.40 | Low water. | | |
| Renfro's Creek... | Nr. m'th, nr. Draket'n | 31.40 | 3.56 | 2.85 | 10.00 | 35.60 | 28.50 | Above " " | | |
| HARRIS COUNTY. | | | | | | | | | | |
| Mulberry Creek... | Emery's Mill..... | ..... | ..... | ..... | 60.00 | ..... | ..... |  |  | Too full for measurement; has about 150 feet in spring months. Falls 60 ft. in ¼ mile. |
| Mountain Creek... | River Road..... | 63.00 | 7.18 | 5.74 | 20.00 | 143.60 | 114.88 | Low spring or more. | | |
| HEARD COUNTY. | | | | | | | | | | |
| Potato Creek..... | County Line..... | 22.00 | 2.52 | 2.01 | 10.00 | 25.20 | 20.10 | Low spring. | Locke. | Sand Beds. |
| New River..... | ¼ mile month..... | 136.08 | 15.68 | 12.54 | 10.00 | 156.80 | 125.40 | " " | " | |
| Chattahoochee.... | Lot 344 and 3d..... | 3000.00 | 340.80 | 272.64 | 10.00 | 3408.00 | 2726.40 | Low water estimated. | " | Shoals about 1 mile l'g. |
| Central Hatchee... | Near mouth..... | 100.00 | 11.34 | 9.08 | 10.00 | 113.40 | 90.80 | Low spring. | " | |
| JACKSON COUNTY. | | | | | | | | | | |
| Curry's Creek..... | Near Jefferson..... | 8.00 | 0.91 | 0.72 | 18.00 | 16.42 | 13.13 | | Barrow. | |

| Ocoee River..... | 91.39 | 10.42 | 8.33 | 26.00 | 270.87 | 216.69 | Head is all shoal. |
|--------------------------|---------|--------|--------|-------|---------|---------|--------------------|
| JASPER COUNTY. | | | | | | | |
| Ocmulgee River.... | 2186.00 | 246.00 | 196.80 | 39.62 | 9840.00 | 7872.00 | Frobel. |
| " " " | 2186.00 | 246.00 | 196.80 | 7.50 | 1845.00 | 1476.00 | " |
| " " " | 1416.00 | 160.80 | 128.64 | 11.64 | 1851.50 | 1481.20 | " |
| Seven Islands Shoals. | 2917.00 | 331.37 | 265.00 | 19.51 | 6620.00 | 5296.00 | " |
| JEFFERSON COUNTY. | | | | | | | |
| Limestone Creek.... | 20.00 | 2.28 | 1.82 | 7.00 | 15.96 | 12.76 | Barrow. |
| Williamson Sw'p. " | 100.00 | 11.36 | 9.12 | 10.00 | 113.60 | 91.12 | " |
| Hend's Mill..... | 12.07 | 1.37 | 1.09 | 15.00 | 20.64 | 16.51 | " |
| JOHNSON COUNTY. | | | | | | | |
| Deep Creek..... | 18.00 | 2.05 | 1.64 | 10.00 | 20.50 | 16.40 | Locke. |
| Buckeye Creek..... | 30.00 | 3.42 | 2.73 | 10.00 | 34.20 | 27.30 | " |
| Prong of Ochopee | 5.00 | 0.57 | 0.45 | 10.00 | 5.70 | 4.50 | " |
| JONES COUNTY. | | | | | | | |
| Ocmulgee River.... | 2917.00 | 331.37 | 265.09 | 2.30 | 761.30 | 609.00 | Frobel. |
| " " " | 2917.00 | 331.37 | 265.09 | 5.10 | 1688.10 | 1350.50 | " |
| " " " | 2917.00 | 331.37 | 265.09 | 1.30 | 441.60 | 333.28 | " |
| Glover's Mill Shoals... | 2917.00 | 331.37 | 265.09 | 17.90 | 5958.00 | 4766.40 | " |
| LINCOLN COUNTY. | | | | | | | |
| Little River..... | 100.00 | 11.36 | 9.12 | 9.00 | 102.6 | 82.08 | Barrow. |
| LUMPKIN COUNTY. | | | | | | | |
| Jones Creek..... | 5.00 | 0.57 | 0.45 | 50.00 | 28.50 | 22.80 | " |
| Nimble Will..... | 50.00 | 5.70 | 4.56 | 12.00 | 68.40 | 54.72 | " |
| Etowah River..... | 200.00 | 22.80 | 18.24 | 10.00 | 228.00 | 182.40 | " |

A Partial List of the Water-Powers in Georgia, Etc.—(Continued.)

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second. | Theoretical horse-power of 1-foot head. | Available horse-power of 1 foot head. | Approximate head of an assumed head of 10 feet. | Theoretical power of stream with this head running 24 hrs. | Available power of stream with this head working 24 hrs. of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|---------------------|------------------------|------------------------|-----------------------------------------|---------------------------------------|-------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------|----------------------|-------------------|--------------------------------------|
| LUMPKIN Co.—Cont. | | | | | | | | | | |
| Cane Creek..... | Near Dahlonga..... | 40.00 | .56 | 3.64 | 10.00 | 45.60 | 36.40 | | Barrow. | Very large power; uses only 90 H. P. |
| Yahoola River..... | Mining Co..... | | | | | | | | " | |
| MCDUFFIE COUNTY. | | | | | | | | | | |
| Sweet Water Cr'k. | Cotton Card Factory... | | | | 21.00 | 36.00 | | | " | Estimated from wheel. |
| Little River..... | Belknap Smith..... | 47.00 | 5.35 | 4.28 | 8.00 | 42.86 | 34.28 | | " | |
| MILLER COUNTY. | | | | | | | | | | |
| Spring Creek..... | Colquitt..... | 66.56 | 7.52 | 6.01 | 10.00 | 75.20 | 60.10 | Low water. | Locke. | Banks very flat. |
| MILTON COUNTY. | | | | | | | | | | |
| Four Killer..... | Cr. Camp's Mill..... | 28.00 | 2.68 | 2.12 | 10.00 | 53.60 | 42.40 | Flush. | " | At low water about 10.0 cubic feet. |
| Big or Vic'ry's Cr. | Above Lebanon Mills. | 114.39 | 12.95 | 10.32 | 10.00 | 129.50 | 103.20 | Low spring. | " | |
| Little River..... | Graham's Mill..... | 119.00 | 13.51 | 10.80 | 10.00 | 135.10 | 108.00 | " or more. | " | |
| MONROE COUNTY. | | | | | | | | | | |
| Bushy Creek..... | 4 miles Daniels..... | 5.00 | 0.57 | 0.45 | 10.00 | 5.70 | 4.50 | Low spring or more. | " | |
| Ocmulgee River... | Taylor's Shoal..... | 2917.00 | 331.37 | 265.09 | 5.70 | 1886.70 | 1509.30 | Low water. | Frobel. | Fall exclusive of dam. |

| Ocmulgee River | Falling Creek Shoal..... | 2917.00 | 331.37 | 265.09 | 1.71 | 562.70 | 450.16 |
|---------------------------------|------------------------------|---------|--------|--------|-------|------------------|---------------------------------------------------|
| " " | Dane's Shoal..... | 2917.00 | 331.37 | 265.09 | 3.6 | 1191.60 | " " |
| " " | Capp's Shoal..... | 2917.00 | 331.37 | 265.09 | 5.60 | 1853.60 | " " |
| " " | Pitman's Shoal..... | 2917.00 | 331.37 | 265.09 | 3.50 | 1158.50 | " " |
| MURRAY COUNTY. | | | | | | | |
| Polecat Creek..... | 214, 8 and 3 | 5.2 | 0.59 | 0.47 | 10.00 | 5.90 | Barrow. |
| Sugar " | 208..... | 15.3 | 1.74 | 1.39 | 10.00 | 17.40 | " " |
| Mill " | 299, 26 and 2..... | 20.0 | 2.28 | 1.80 | 10.00 | 22.80 | " " |
| Holly " | 204, 26 and 2..... | 20.0 | 2.28 | 1.80 | 10.00 | 22.80 | " " |
| MUSCOGEE COUNTY. | | | | | | Above low water, | |
| Bull Creek..... | Road to Woolfolk's..... | 25.00 | 2.84 | 2.27 | 10.00 | 28.40 | Very sandy. |
| Chattahoochee | Columbus..... | 3000.00 | 340.80 | 272.64 | 106.0 | 36040.00 | Fall given by Capt. Bass
Cubic feet estimated. |
| NEWTON COUNTY. | | | | | | | |
| Yellow River..... | Georgia R. R. Bridge.... | 666. | 75.60 | 60.5 | 4.32 | 325.00 | Fall of shoal exclusive
of dam. |
| " " | Cedar Shoals | 716. | 81.30 | 65.00 | 62.66 | 5020.00 | " " |
| " " | Indian Fishery Shoals | 716. | 81.30 | 65.00 | 12.27 | 996.00 | " " |
| " " | Allen's Shoals..... | 716. | 81.30 | 65.00 | 1.83 | 126.00 | " " |
| " " | Lee's Shoal..... | 716. | 81.30 | 65.00 | 3.97 | 324.00 | " " |
| " " | Dried Indian Shoal..... | 716. | 81.30 | 65.00 | 7.24 | 573.00 | " " |
| OGLETHORPE COUNTY. | | | | | | | |
| Long Creek..... | 4 miles South Lexington..... | 7.20 | 0.83 | 0.66 | 10.00 | 8.30 | Barrow. |
| PAULDING COUNTY. | | | | | | | |
| Tributary Pump-
kinvine..... | Stearn's Mill..... | 6.00 | 0.68 | 0.54 | 12.0 | 8.16 | Locke. |
| Little " | 16 miles Marietta | 10.00 | 1.14 | 0.91 | 20.0 | 22.8 | " " |
| Raccoon Creek | Channel's Store..... | 22.0 | 2.51 | 2.00 | 12.0 | 30.00 | Or flush. |

A Partial List of the Water-Powers in Georgia, Etc.—(Continued.)

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second. | Theoretical horse-power of one-foot head. | Available horse power of one foot head. | Approximate head of an assumed head of 10 feet. | Theoretical power of stream with this head running 24 hours. | Available power of stream with this head working 24 hours of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|-------------------------------|-----------------------------|------------------------|-------------------------------------------|-----------------------------------------|-------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------|----------------------|-------------------|----------|
| PAULDING Co.—Cont. | | | | | | | | | | |
| Peggy more..... | Lee's, near mouth..... | 11.18 | 1.26 | 1.01 | 10.00 | 12.60 | 10.10 | Low water. | Locke. | |
| Sweet Water..... | Seal's Bridge | 12.00 | 1.36 | 1.08 | 10.00 | 13.60 | 10.80 | | | |
| PICKENS COUNTY..... | | | | | | | | | | |
| Big Scared Corn..... | Fairmount Road | 11.00 | 1.25 | 1.00 | 10.00 | 12.50 | 10.00 | | Barrow. | |
| Little " " | " and Jasper Road .. | 4.50 | 0.51 | 0.40 | 10.00 | 5.10 | 4.00 | | | |
| Talking Rock C'k | Federal Road | 13.33 | 1.52 | 1.21 | 10.00 | 15.20 | 12.10 | | | |
| Love's Creek..... | " | 7.00 | 0.79 | 0.63 | 18.00 | 14.36 | 11.48 | | | |
| Long Swamp | Below Forks | 40.00 | 4.56 | 3.64 | 10.00 | 45.60 | 36.40 | | | |
| Tributary of Long Swamp | Federal Road | 6.00 | 0.68 | 0.54 | 10.00 | 6.80 | 5.40 | | | |
| Stegall's Mill C'k | Stegall's Mill | 10.00 | 1.14 | 0.91 | 10.00 | 11.40 | 9.10 | | | |
| Long Swamp | Marble Quarry | 23.00 | 2.62 | 2.09 | 10.00 | 26.20 | 20.96 | | | |
| Fork Swamp..... | Jasper Road | 8.11 | 0.92 | 0.73 | 12.00 | 11.08 | 8.86 | | | |
| POLK COUNTY. | | | | | | | | | | |
| Euharlee..... | Rockmart | 25.00 | 2.85 | 2.28 | 10.00 | 28.50 | 22.80 | Minimum low water | | |
| " | 2 miles North Rockmart..... | 19.00 | 2.15 | 1.72 | 10.00 | 21.50 | 17.20 | Low spring. | | |
| " | Hightower's Mill..... | 5.40 | 6.12 | 0.49 | 90.00 | 54.90 | 44.10 | " | | |

| | | | | | | | | | |
|----------------------|-------------------------------------------|--------|-------|-------|-------|---------|--------|-------------|-----------------------------------------|
| Big Spring..... | Rome and Van Wert
Road, 2 miles Van W. | 5.00 | .57 | .45 | 10.00 | 5.70 | 4.50 | Low spring. | Barrow. |
| Little Cedar | Young's Mill..... | 17.70 | 2.00 | 1.60 | 10.00 | 20.00 | 16.00 | " | " |
| Big Spring..... | Cedartown..... | 9.60 | 1.08 | .86 | 10.00 | 10.80 | 8.60 | " | " |
| Gut Creek..... | At mouth..... | 27.20 | 3.06 | 2.45 | 10.00 | 30.60 | 24.50 | " | " |
| or more. | | | | | | | | | |
| QUITMAN COUNTY. | | | | | | | | | |
| Hoelarnee | Near mouth..... | 6.00 | 0.68 | 0.54 | 10.00 | 6.80 | 5.44 | Low water. | Locke. |
| Tohehannee..... | 1 mile S. E. Georget'n | 10.00 | 1.14 | 0.91 | 10.00 | 11.40 | 9.12 | " | " |
| RABUN COUNTY. | | | | | | | | | |
| Head of Stekoa.... | Near Clayton..... | 3.75 | 0.43 | 0.34 | 30.00 | 12.90 | 10.32 | Barrow. | |
| — Creek..... | Mouth..... | 30.00 | 3.42 | 2.73 | 12.00 | 41.04 | 32.83 | " | " |
| Wildcat Creek..... | " | 50.00 | 5.70 | 4.56 | 10.00 | 57.00 | 45.60 | " | " |
| Tiger Creek..... | " | 40.60 | 4.63 | 3.70 | 15.00 | 63.45 | 55.56 | " | " |
| RANDOLPH COUNTY. | | | | | | | | | |
| Roaring Branch.... | 5 miles Fort Gaines... | 4.00 | 0.45 | 0.36 | 30.00 | 11.50 | 10.60 | Low water. | Locke. |
| Wakefortsee Cr'k. | Nr. Chemochechobee. | 5.00 | 0.57 | 0.45 | 10.00 | 5.70 | 4.50 | " | " |
| RICHMOND COUNTY. | | | | | | | | | |
| Augusta Canal..... | Augusta | | | | | 1200.00 | | | B. Holly
Canal
Engin'r
Barrow. |
| Little Spirit Cr'k.. | At mouth..... | 12.00 | 1.36 | 1.08 | 8.00 | 10.94 | 8.75 | ..... | ..... |
| SCRIVEN COUNTY. | | | | | | | | | |
| Beaver Dam Creek... | Jacksonborough..... | 87.35 | 9.95 | 7.96 | 7.00 | 69.70 | 55.76 | ..... | ..... |
| Briar Creek..... | Mill Haven..... | 565.50 | 64.46 | 51.56 | 10.00 | 644.60 | 515.68 | ..... | " |
| Rocky Creek..... | Wade's Mill..... | 12.00 | 1.37 | 1.09 | 5.00 | 6.84 | 5.47 | ..... | " |

Very high h'ds at times

A Partial List of the Water-Powers in Georgia, etc.—(Continued.)

| NAME OF STREAM. | POINT OF SECTION. | Cubic feet per second. | Theoretical horse power of 1 foot head. | Available horse-power of one-foot head. | Approximate head or an assumed head of 10 feet. | Theoretical power of stream with this head running 24 hrs. | Available power of stream with this head running 24 hrs. of each day. | Condition of stream. | By whom surveyed. | REMARKS. |
|------------------------|-----------------------------|------------------------|-----------------------------------------|-----------------------------------------|-------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------|----------------------|-------------------|----------------------|
| STEWART COUNTY. | | | | | | | | | | |
| Wimberly's Br'ch | Grimes & Free'n's Mill | 8.80 | 1.00 | 0.80 | 12.00 | 12.00 | 9.60 | Low water | Looke. | Estimated. |
| Hodchodkee | Scott's Mill. ... | 12.00 | 1.35 | 1.08 | 10.00 | 13.50 | 10.80 | " | " | " |
| TWIGGS COUNTY. | | | | | | | | | | |
| Big Sandy | Myrick's Mill ..... | ..... | ..... | ..... | 8.00 | ..... | ..... | ..... | ..... | Too full to measure. |
| TROUP COUNTY. | | | | | | | | | | |
| Shoal Creek | Troup Factory | 81.10 | 9.22 | 7.38 | 18.00 | 166.14 | 132.91 | Low water or more. | " | Estimated by wheels. |
| Muddy Creek | 5½ miles LaGrange | 7.00 | 0.79 | 0.63 | 10.00 | 7.90 | 6.30 | " | " | " |
| Blue John | 2½ miles LaGrange | 3.00 | 0.34 | 0.27 | 10.00 | 3.40 | 2.70 | " | " | " |
| Panther Creek | 3½ mi's LaGrange | 25.00 | 2.84 | 2.27 | 10.00 | 28.40 | 22.70 | " | " | " |
| Flat Creek | 3¼ mi's Gorham's Mill | 20.00 | 2.28 | 1.82 | 12.00 | 27.36 | 21.88 | " | " | " |
| Beach Creek | 5 miles LaGrange | 35.00 | 4.00 | 3.20 | 15.00 | 60.00 | 48.00 | " | " | " |
| Yellow Jacket | 3½ miles LaGrange | 87.36 | 9.92 | 8.03 | 10.00 | 99.20 | 80.30 | " | " | " |
| WALKER COUNTY. | | | | | | | | | | |
| Fork of Dry Cr'k. | ½ mile mouth | 6.5 | 0.74 | 0.56 | 10.00 | 7.40 | 5.90 | ..... | Barrow. | ..... |

| WASHINGTON CO. | | 1.36 | 1.08 | 12.00 | 16.41 | 13 12 | Barrow. |
|-------------------------------|------------------------------------------|--------|-------|-------|--------|--------|-----------------------|
| Creek at.... | Curry's Mill..... | 12.00 | | | | | |
| Ogeechee River... | Gibson and Sanders-
ville Road..... | 100.80 | 11.49 | 9.19 | 10.00 | 91.90 | Minimum
low water. |
| WHITE COUNTY. | | | | | | | |
| Chickamauga | Dover's Mill..... | 34.12 | 3.78 | 3.02 | 10.00 | 37.80 | Low water. |
| Lit. Chickamauga | Near mouth..... | 3.00 | 0.34 | 0.27 | 10.00 | 2.70 | " " |
| Bean Creek..... | " " | 6.50 | 0.75 | 0.60 | 10.00 | 6.00 | " " |
| Chattahoochee..... | Nicholls' Mill..... | 72. | 7.98 | 6.38 | 10.00 | 63.80 | Minimum
Low water. |
| " | Amey's Ford..... | 226.80 | 25.80 | 20.70 | 10.00 | 258.00 | Low water. |
| Smith's Creek..... | Mouth..... | 14.00 | 1.60 | 1.28 | 10.00 | 16.00 | " " |
| " | Anna Rubie Falls..... | 7.0 | 0.81 | 0.64 | 300.00 | 243.00 | " " |
| Dean's Ditch..... | " | 5.15 | 0.59 | 0.47 | 10.00 | 5.90 | " " |
| Duke's Creek..... | Minnehaha Falls..... | 3.60 | 0.41 | 0.32 | 300.00 | 123.00 | Minimum
low water. |
| N. Prong Duke's
Creek..... | Near Minnehaha Falls | 12.88 | 1.47 | 1.17 | 300.00 | 441.00 | " " |
| Tenatee | Dr. Moody's..... | 95.31 | 10.83 | 8.66 | 10.00 | 108.30 | " " |
| White's Creek..... | Poe's Mill..... | 10.50 | 1.20 | 0.96 | 13.00 | 15.60 | Low water. |
| Mary Creek..... | Gainesville and Cleve-
land R. R..... | 9 10 | 1.02 | 0.81 | 10.00 | 10.20 | " " |
| WHITEFIELD COUNTY. | | | | | | | |
| Creek..... | County Line..... | 5.5 | 0.62 | 0.49 | 10.00 | 6.20 | |
| Swamp Creek..... | Lot 113..... | 34.0 | 3.87 | 3.09 | 10.00 | 38.70 | |
| Carpenter's Creek | 1/2 mile south Tilton | 11.0 | 1.25 | 1.00 | 10.00 | 12.56 | |
| Mill Creek | 148, 13 and 3..... | 16.0 | 1.82 | 1.45 | 10.00 | 18.20 | |
| " " | Dug Gap | 13.0 | 1.48 | 1.18 | 10.00 | 14.80 | |

W H I T F I E L D C O U N T Y.

| | |
|----------------------|------------------------|
| Creek..... | County Line..... |
| Swamp Creek..... | Lot 113..... |
| Carpenter's Creek .. | ½ mile south Tilton .. |
| Mill Creek | 148, 13 and 3..... |
| " .. | Dug Gap |

THE COMMONWEALTH OF GEORGIA.

PART II.—THE PEOPLE.

CHAPTER I.

ORIGIN AND CHARACTERISTICS OF THE PEOPLE.

THE DOMINANT RACE.

In order to have a perfect understanding of the character of a people, it is very important to know their *origin*—the race from which they sprang.

As the dominant race—both in numbers, intelligence, moral qualities and general importance—the white people are entitled to first and chief consideration. The history of Georgia—of her achievements in the arts of peace and war, her intellectual and moral development, her political influence and status—is the history of her *white people*. What may be said in the first part of this chapter will relate to the WHITE PEOPLE of Georgia, the origin and characteristics of the negro race being reserved for separate discussion.

Several centuries ago the revolutions of European governments, the religious reformatations and persecutions, and wholesale prescriptions and expatriations of large communities of people, resulted in the crystallization of kindred elements of blood, religious beliefs, and political creeds, through the medium of common sympathy and a common cause, into certain definite types of civilization. Among these consolidations of different off-shoots of the same original, none has resulted in a more homogeneous compound than that of the *Anglo-Saxon*. Without going into the history of this race, it being unnecessary to our purpose, it is sufficient to point, with the just

pride of an individual member, to the achievements in art, science, philosophy, literature, morals, territorial development, and last, though not least, in fulfilling the scriptural injunction, "to increase, multiply and replenish the earth," that have characterized the history of the English race since the days of the Norman Conquest.

To this great race Georgia owes her origin as a commonwealth and as a people. With a moderate admixture of Scotch and Irish immigrants, the colony of Georgia began its career in the year 1732. Fresh installments of colonists, in limited numbers, followed the first brave settlers under General Oglethorpe, the social character and standing increasing, perhaps, with successive arrivals.

In the meantime, as the natural advantages of the infant colony became manifest, immigrants from the older colonies, eastward—Virginia and North and South Carolina—began to arrive within the borders of Georgia, whose territory then stretched westward to the banks of the Mississippi river. Immediately following the American Revolution, which resulted in the separation of the original colonies from Old England, the movement of population became more and more decided, until it finally became a tidal wave of restless immigrants seeking for homes in the then West. In obedience to natural laws, this movement followed, more or less closely, the parallels of latitude. Georgia was then the extreme southwestern State of the Federal Union. There being no mountain chains, or other natural impediments to the easy progress of the pioneer, between Georgia and the States east and northeast, a larger percentage of inter-state immigration, than would have otherwise occurred, was diverted from the lines of latitude, and the State became the new home of thousands of the hardy sons of Maryland, Virginia and the Carolinas. The original colonial population of these States differed little from that of Georgia, being, perhaps, of a little higher social origin. The infusion was a decided benefit. The aristocratic blood of Maryland and Virginia, and the impulsive, independent, liberty-loving stream from the Carolinas, mingled harmoniously with the more recent current from the Old Country, and readily combined to form the life-blood of the typical Georgian. We say typical; yet the population of the mountain section of the State appears radically different from that of the coast region. This difference, however, is due more to the results of culture and leisure

that comparative wealth renders possible than to any inherent or original differences. The population of Northeast Georgia is largely made up of immigrants and their descendants from the mountain regions of the States lying eastward. These, in their turn, had an unusual sprinkling of Scotch blood, due to another natural law that impels emigrants from an older country to seek the counterpart of their own familiar mountains, dales or plains, as the case may be, in the Eldorado of their future. The rough, hardy Scotch, inured to hardship, accustomed to their cold mountain springs and clear streams of water, upon landing on the coast regions of the Old Dominion and the Old North State, would naturally seek the Piedmont region. From thence, along the valleys, they have crossed over into Georgia, still finding a congenial home and a thousand reminders of bonny Scotland. Thus the people of Northeast Georgia are largely of Scotch descent, as is otherwise indicated by the prevalence of the prefix, "Mac." Northwest Georgia has received considerable accessions of population, by way of reflex, from East Tennessee, whose rich valleys extend into the northwestern counties of Georgia. Many of these were also of Scotch descent. The seacoast counties, on the other hand, received their principal accessions of population from a class who were blessed with more wealth and corresponding culture—a class that were more strongly wedded to the traditions of England and France. The wealthy rice and Sea Island cotton-planters of the coast regions of the two Carolinas very naturally tended to the corresponding region of Georgia. The culture of rice and Sea Island cotton, in the damp, malarial, tidewater country, was uncongenial to the white laborer. Indeed, the culture of these crops seemed to demand large organized gangs of negroes, under the control of one intelligent head; and the machinery necessary required large capital for its construction and operation. So this portion of the State was quickly converted into large estates, cultivated almost entirely with slave labor, the proprietors generally fixing their residences, or at least spending a large portion of their lives, in the cities of Savannah and Augusta. The habit of command, in connection with abundant wealth and the leisure to enjoy it, very naturally tended to develop luxury, refinement and exclusiveness, which are usually attributed to the educated classes of Southeast Georgia, particularly of the city of Savannah. Middle Georgia—the most

densely populated section of the State—the western portion of Southeast Georgia, and the eastern portion of East Georgia comprise a population whose characteristics are a *mean* between extremes. The average Middle Georgian is the average Georgian, and gives character to the people at large.

Finally, as regards origin, the present white population of Georgia is pre-eminently of British extraction, being descended from the original English colonists and immigrants from the States eastward, themselves of equally pure English stock. The infusion of blood, foreign to English veins, has never been sufficient to make any decided impression on the original stock, except in very confined localities. If all the sources could be blended equally and uniformly throughout the whole population, the result would be, practically, pure English, so slight would be the effect of other blood.

THE CHARACTERISTICS of the people of Georgia are not essentially different from those of the people of Virginia, from whence the most controlling influence in our civilization was derived. Middle Georgia, especially, is Virginian in modes of life, speech and manners. In common with her sister States of the old South, the ruling class have been the wealthy slave-owners and others in full sympathy with them. Wealth furnishes facilities for mental and social culture, and leisure for the study of politics. The habit of command and the power to enforce obedience naturally tend to develop a disposition to leadership and control in the affairs of state. These causes conjoined made the South prolific of statesmen and leaders of public opinion, and pre-eminent, through a long series of years, for the influence exerted in national affairs. The results of the War between the States, though especially disastrous in a financial sense to the leading class, were not sufficient to crush entirely the disposition to leadership, which had become so strongly fixed, nor could they effect natural qualifications for statesmanship.

As the years roll by, and material prosperity begins once more to crown with success the efforts of a struggling people, the South gradually resumes her ancient position of power and influence. Of these qualities that have been mentioned, the people of Georgia have enjoyed and manifested more than an average degree. First to recover from the devastations and apparent ruins of war, and the dismay which paralyzed for a time the energies of the whole

South, the people of Georgia have taken the lead of their late brethren in arms in all the arts of peace and the measures of progress. The arbitrament of the sword has been accepted, in good faith, as final and conclusive of the unfortunate issues that estranged the sections, and Georgia is foremost in proving, by her deeds as well as by speech, that she is determined to forget "the things that are past," and to push on to the goal in the effort to redeem lost time and capital, build up her waste places, and rehabilitate the country with the mantle of peace, prosperity, contentment, and happiness.

Georgians are noted for open hospitality, their kindly welcome to strangers, their chivalric devotion to the weaker sex, and their love of law and order. They also manifest a somewhat peculiar independence and conservatism of thought and action. There has been but little of *bossism* in her politics, fanaticism in her religion and morals, or communism among her laboring classes.

Georgians may be *led*, so long as the course of leadership commends itself to their reserved judgment, but not *driven*. They are prompt to recognize eminent abilities; they are ardent admirers of high qualities of eloquence and statesmanship, but prompt to denounce sophistry, demagogism, and error. Woe to the political leader who attempts to conduct them into the camp of the enemy!

The various *isms* that sorely afflict other States and countries find no encouragement or foothold in Georgia. Not that any restrictions of law are thrown around them, except the law of a conservative public sentiment. Free-love-ism, religious fanaticism, free-thought-ism, communism, labor-strikes, etc., find few adherents or exponents.

THE NEGRO RACE.

The negro population of Georgia is almost wholly made up of descendants of slaves brought from Maryland, Virginia and the Carolinas, especially from Virginia. The number directly imported into the State from Africa was very small, and their descendants are chiefly to be found in the southeastern part, or coast region of the State, including the sea islands. While the originals of the better type of American negroes, as they still exist in Africa, are

much inferior to some of the interior tribes of Africa in moral and intellectual capacity, they were not of the lowest tribes. The sea-coast negroes of South Carolina and Georgia—"rice plantation negroes," as they are sometimes called—have evidently sprung from a tribe, or tribes, that were lower in the scale of humanity than were the ancestors of the negroes of Middle Georgia—the "old Virginia stock." The lower physical and cranial development of the former sufficiently attest the above statement, were there not other differences less strongly marked.

The peculiar "lingo," or barbarous admixture of remains of the native speech of the low country negro, the apparent difficulty they experience in mastering the sounds of the English language, would itself indicate a diverse origin, amounting almost to a difference in the formation of the organs of speech.

These differences, however, are of small importance with reference to the purpose of this chapter; nor is it within the purview of this book to discuss, in detail, the mooted question of the relative mental temperament of the whites and blacks. This inquiry has been much complicated by feelings of prejudice on the one hand and interested partisanship on the other. Physical and structural differences—differences, too, in those organs which are universally admitted to be indicative of differences in intellectual and moral strength, are too manifest to be disputed. It would be but reasonable to expect the mental differences to be as great as the physical. This conclusion would probably be readily reached by a close and unprejudiced observer. Such an observer would doubtless declare that the advocates on both sides of the question have been extravagant, if not intemperate, in their expressed views of the capacity of the negro mind for development. While the history of the race, back to the undiscoverable past, has noted no clear and undisputed instances of distinguished success in science, philosophy, poetry, or art, yet the capacity of the very young negro children for acquiring knowledge through the ordinary methods of the schools must be admitted as pretty nearly, if not quite, equal to that of white children. But as they advance in physical growth towards puberty, their intellectual development does not keep pace with the physical. What shall we say of the moral capacity of negroes? Some writer has said that the negro is rather *non-moral* than *immoral*,

which is to say that the moral crimes he commits, in the gratification of his desires, are attributable more to his dullness of moral perception than to his deliberate disregard of moral principle. No people are more religious, yet the lives of none are more inconsistent with the professions of godliness. In some of the relations of life, the negro is a law unto himself, holding that certain acts are no wrong if no detection follows commission.

In a state of slavery it was a wide-spread belief among them that stealing from the master was not a crime, "if not found out." These, and some other peculiarities, may be justly considered as inherent in the race, and may probably be referred to the teachings and practices of their progenitors for thousands of years, which teachings have resulted in fixing these singularly oblique perceptions as race characteristics.

It must not be understood that every individual is the subject of these peculiarities. There are those who affirm that all negroes are dishonest—all negro women are unchaste; but such intemperate assertions must be set down to the score of blind partisan prejudice, hardly believed by their authors. On the contrary, there are many bright exceptions, and have been all through their bondage as a race. There has been much wholesale, indiscriminating, and consequently unjust aspersions upon the moral and intellectual character and habits of the negro race, on the one hand, and equally as extravagant assertions of equality of natural endowments on the other. The truth lies between these extremes. The negro is certainly inferior to the white race—how far we shall not undertake to say—in the chief natural requisites that underlie the highest achievements in moral, intellectual, social and political excellence.

In justice, it should be said of them that during the late fratricidal war between the States, the slaves exhibited a wonderful degree of fidelity to the trust reposed in them, of necessity, by their absent masters and owners. The expectations on the one hand and apprehensions on the other, that servile insurrections, rapine and pillage would desolate the interior of the Confederacy, were alike disappointed. So far from being an element of weakness on the side of the struggling South, it is difficult to conceive how the great struggle could have been so prolonged, if it had not been for the productive power of the negroes on the farms and plantations.

Many instances occurred during the war of unswerving devotion to the master and his family, in the very presence of the liberating forces, that testified to the strong feeling of personal attachment of the untutored slave to his life-long protector, friend and master. The forced disruption of the ties that had so long bound the inferior to the ruling race was not the least of the sad results of the war.

CHAPTER II.

POPULATION, WEALTH AND OCCUPATIONS.

POPULATION BY SECTIONS.

Georgia is a large State, and embraces within its borders a very considerable range of elevation, latitude and geological formation. As a necessary consequence, we find a great diversity of climate, soils, forestry and productions. The capabilities of the several sections differ so greatly, the crops and methods of culture are so diverse, that it has been found desirable, if not indispensable, to divide the 137 counties of the State into sections, grouping them together with reference to geographical location, and, to some extent, according to geological formations. This division was made in 1878 by the then Commissioner of Agriculture, and has been adhered to in all subsequent publications of crop statistics. The arrangement divided the State into five somewhat unequal sections.

For the purposes of this work, North Georgia has been subdivided into North Georgia—East, and North Georgia—West, and Middle Georgia into Middle Georgia—East, and Middle Georgia—West.

The following table shows the counties composing each section and sub-section :

TABLE No. IV.

The following Counties Compose the Several Sections, viz:

| North Georgia, 33.
N. East, 15. | Middle Georgia, 40.
Mid. East, 16 | S. W. Georgia, 32. | E. Georgia, 17 | S. E. Georgia, 15. |
|------------------------------------|--------------------------------------|--------------------|----------------|--------------------|
| Banks | Baldwin | Baker..... | Bullock | Appling .. . |
| Dawson | Clarke..... | Berrien..... | Burke | Bryan..... |
| Forsyth | Columbia. . | Brooks | Dodge | Camden..... |
| Franklin..... | Elbert. | Calhoun..... | Emanuel.... | Charlton .. . |
| Gwinnett .. | Greene..... | Chat'hoochee | Glascok..... | Chatham .. . |
| Habersham .. | Hancock.... | Clay | Jefferson .. | Clinch |
| Hall | Jones | Colquitt | Johnson .. | Coffee..... |
| Hart | Lincoln..... | Crawford .. | Laurens..... | Echols..... |
| Jackson | McDuffie,... | Decatur | Montgomery | Effingham. . |
| Lumpkin.... | Morgan..... | Dooly..... | Pulaski | Glynn..... |
| Madison | Oconee..... | Dougherty. . | Richmond.. | Liberty..... |
| Rabun | Oglethorpe. . | Early | Screven | McIntosh... |
| Towns..... | Putnam | Houston | Tattnall.... | Pierce |
| Union | Taliaferro .. | Irwin | Telfair..... | Ware |
| White | Warren | Lee | Twiggs..... | Wayne..... |
| N. West, 18. | Wilkes..... | Lowndes .. | Washington. | ..... |
| Bartow..... | Mid. West, 24 | Macon..... | Wilkinson.. | ..... |
| Catoosa..... | Bibb..... | Marion..... | ..... | ..... |
| Chattooga .. | Butts | Miller ..... | ..... | ..... |
| Cherokee .. | Campbell .. | Mitchell .. | ..... | ..... |
| Cobb | Carroll | Muscogee. . | ..... | ..... |
| Dade | Carroll | Quitman.... | ..... | ..... |
| Fannin..... | Clayton..... | Randolph .. | ..... | ..... |
| Floyd | Coweta | Schley ..... | ..... | ..... |
| Gilmer..... | DeKalb..... | Stewart ..... | ..... | ..... |
| Gordon..... | Douglas..... | Sumter. .... | ..... | ..... |
| Haralson .. | Fayette..... | Taylor ..... | ..... | ..... |
| Milton..... | Fulton..... | Terrell ..... | ..... | ..... |
| Murray..... | Harris | Thomas ..... | ..... | ..... |
| Paulding.... | Heard | Webster ..... | ..... | ..... |
| Pickens..... | Henry | Wilcox..... | ..... | ..... |
| Polk..... | Jasper | Worth ..... | ..... | ..... |
| Walker..... | Meriwether.. | ..... | ..... | ..... |
| Whitfield .. | Newton..... | ..... | ..... | ..... |
| ..... | Pike ..... | ..... | ..... | ..... |
| ..... | Rockdale.... | ..... | ..... | ..... |
| ..... | Spalding ..... | ..... | ..... | ..... |
| ..... | Talbot..... | ..... | ..... | ..... |
| ..... | Troup ..... | ..... | ..... | ..... |
| ..... | Upton ..... | ..... | ..... | ..... |
| ..... | Walton..... | ..... | ..... | ..... |

AGGREGATE POPULATION.

Number. The population of Georgia, by the census of 1880, was 1,542,180, being 26.1 persons per square mile.

Families. The number of families was 303,060—an average of 5.09 persons to a family.

Dwellings. The dwellings were 289,474—an average of 5.23 persons to a dwelling.

Distribution.—Territorial.

| Section. | Population. | Per Sq. Mile. |
|-------------------------|-------------|---------------|
| North Georgia | 337,000 | 30 |
| Middle Georgia..... | 568,000 | 43 |
| Southwest Georgia | 310,000 | 21 |
| East Georgia..... | 207,000 | 20 |
| Southeast Georgia | 120,200 | 12 |

A table showing the population of the counties will be given hereafter.

Town and Country.

The census does not supply the exact information. The information obtained at considerable pains is approximately as follows:

| | |
|----------------------------------|-------------|
| Rural population, 1,266,900..... | 82 per cent |
| Town, 275,280..... | 18 per cent |

There are in Georgia—

| | |
|------------------------------------------|-----|
| Cities with over 10,000 inhabitants..... | 5 |
| Towns, 2,000 to 10,000..... | 15 |
| Towns, 1,000 to 2,000..... | 23 |
| Villages, 500 to 1,000..... | 42 |
| Villages, 200 to 500..... | 129 |
| Villages, 100 to 200..... | 163 |

Cities, towns and villages..... 377

*Population in 1880.**Chief Places.*

| | |
|---------------------|--------|
| Atlanta | 37,409 |
| Savannah | 30,709 |
| Augusta | 21,891 |
| Macon | 12,749 |
| Columbus | 10,103 |
| Athens | 6,099 |
| Rome | 3,877 |
| Milledgeville | 3,797 |
| Americus | 3,635 |
| Griffin | 3,620 |
| Albany | 3,216 |

All these places have increased in population since the census.

The density of the rural population is 21.3 per square mile.

Population by Race.

| | |
|------------------------|--------------|
| White, 816,906 | 53 per cent. |
| Colored, 725,103 | 47 per cent. |

Excess of whites, 91,803. In the cities and towns, the per cent. of colored population is somewhat uniform. In the country it varies widely, from 1 to 90 per cent.

Mistaken estimates have been made of the rate of increase of the colored population as compared with the whites.

Gross errors in these estimates will be exposed in a future chapter.

Population by Age.

| | | |
|------------------------------------|---------|--------------|
| Minors, under 21 | 877,781 | 57 per cent. |
| Adults, over 21 | 664,399 | 73 per cent. |
| School age, 5 to 17 inclusive, ... | 511,555 | 33 per cent. |
| Voters, males over 21 | 321,438 | 21 per cent. |
| Persons over 80 | 6,786 | |

Sex of Population.

| | |
|-------------------------|---------|
| Males | 762,981 |
| Females | 779,199 |
| Excess of females | 16,218 |

Nativity.

| | |
|--------------------|-----------|
| Natives | 1,531,616 |
| Foreign born | 10,564 |

The foreign born are not three-fourths of 1 per cent. of the people

Of these, from Ireland, 4,148; England, Scotland and British America, 1,909; Germany, 2,956; France, 295; Sweden, 138; Switzerland, 107; Italy, 82.

State of Birth.

There are in Georgia, born in other States, 136,402 persons. Of these, born in South Carolina, 50,195; North Carolina, 24,156; Alabama, 17,000; Virginia, 14,606; Tennessee, 10,717; Florida, 5,840; New York, 2,570; New England, 2,144; Pennsylvania, 1,000; all Northern States about 10,000.

Born in Georgia, living in other States, 323,854. Excess of emigrants over immigrants, 187,452. Such excess is common to the older States: in South Carolina the like excess was 195,000; in North Carolina, 242,000; in Virginia, 621,000; in Tennessee, 262,000; in Kentucky, 267,000; in Ohio, 500,000.

Mortality.

Deaths in census year, in Georgia, 21,549—1 to 71.6 persons. In the United States, 758,893—1 to 66.2 persons.

Deaths of persons under 5 years, in Georgia, 10,080—47 per cent. of all. In the United States 302,806—40 per cent. of all.

The mortality among colored infants largely affects this percentage.

Occupations of the People.

All occupations, 597,862. Agricultural, 432,204—72 per cent.; professional and personal services, 104,269—17 per cent.; trade and transportation, 25,222—4 per cent.; manufactures, mining, etc., 36,167—6 per cent.

Of the agricultural class, 145,062 are farmers and planters; 3,202 nurserymen, florists, etc., and 284,060 laborers.

In the professional class, 3,633 are classed as teachers, (too few—6,146 in Report of Schools, etc.); physicians, 1,995; clergymen, 1,747; lawyers, 1,432; journalists, 175.

In manufacturing, the reported number of officers and operators, including those in iron works, is about 6,500; in milling about 4,050; in mining, (too small), 460.

Of mechanics, about 5,000 are carpenters; tailors, 3,258; blacksmiths, 2,898; brick-masons, 1,253; lumbermen, 1,080; (elsewhere much more numerous, 4,971.)

Hotel keepers, etc., 1,728 ; livery stable keepers, 454 ; laundresses, 7,936.

Laborers, 47,219 ; domestic servants, 33,139—(too small).

Defective, Dependent and Delinquent Classes.

Number of insane, 1,697 ; idiotic, 2,433 ; blind, 1,636 ; deaf, 819. Paupers, 1,278. Criminals, 1,837, viz: 231 whites, 1,606 colored. Illiterates over 10 years old, unable to write: whites, 128,934; colored, 391,482.

CENTRES OF POPULATION.

1. The Geographical Centre of Georgia ; 2, the centre of colored population of Georgia, and 3, the centre of colored population of the United States, are all near the same spot, in Twiggs county, not far from Jeffersonville.

The centre of aggregate population of Georgia, and the centre of white population, are both near Forsyth, and only a few miles from each other. That of aggregate population about ten miles, a little north of east, and that of white population about twelve miles northeast of Forsyth. The centre of population is about 40 miles northwest of the centre of area.

It is a remarkable fact in regard to centres of population in the United States, that three of them should be nearly on the same meridian, near the 84th west of Greenwich, near the 7th west of Washington City ; viz: the centre of aggregate population, that of foreign population, and that of colored population. None of them are near the centre of area of the United States, which is in Kansas. All the centres have gradually moved westward.

TABLE No. 1.

Areas, Population and Wealth of Georgia, by Census of 1880.

| | AREA. | POPULATION. | | WEALTH. | |
|---------------------|------------|-------------|---------------|----------------|---------------|
| | Sq. Miles. | Total. | Per Sq. Mile. | Total. | Per Sq. Mile. |
| The State..... | 58,980 | 1,542,180 | 26 | \$ 239,472,599 | \$ 4,050 |
| SECTIONS. | | | | | |
| North Georgia..... | 11,260 | 337,000 | 30 | 44,530,000 | 3,941 |
| Middle Georgia..... | 13,060 | 568,000 | 43 | 91,790,000 | 7,028 |
| S. W. Georgia..... | 14,350 | 310,000 | 21 | 42,790,000 | 2,980 |
| East Georgia..... | 10,470 | 207,200 | 20 | 33,280,000 | 3,178 |
| S. E. Georgia..... | 9,840 | 120,000 | 12 | 26,610,000 | 2,704 |
| COUNTIES. | | | | | |
| Appling..... | 1,080 | 5,276 | 5 | 812,316 | 752 |
| Baker..... | 340 | 7,307 | 21 | 590,883 | 1,738 |
| Baldwin..... | 240 | 13,806 | 58 | 1,146,004 | 4,775 |
| Banks..... | 320 | 7,337 | 23 | 842,740 | 2,634 |
| Bartow..... | 500 | 18,690 | 37 | 3,259,790 | 6,520 |
| Berrien..... | 760 | 6,619 | 9 | 942,240 | 1,240 |
| Bibb..... | 240 | 27,147 | 113 | 8,759,462 | 36,500 |
| Brooks..... | 530 | 11,727 | 22 | 1,832,549 | 3,457 |
| Bryan..... | 400 | 4,929 | 12 | 428,088 | 1,070 |
| Bulloch..... | 900 | 8,053 | 9 | 1,050,398 | 1,167 |
| Burke..... | 1,030 | 27,128 | 26 | 2,308,517 | 2,241 |
| Butts..... | 180 | 8,311 | 46 | 865,919 | 4,810 |
| Calhoun..... | 280 | 7,024 | 25 | 676,810 | 2,417 |
| Camden..... | 620 | 6,183 | 10 | 619,259 | 2,091 |
| Campbell..... | 240 | 9,970 | 42 | 1,449,009 | 6,037 |
| Carroll..... | 540 | 16,901 | 31 | 1,987,688 | 3,680 |
| Catoosa..... | 160 | 4,739 | 30 | 805,115 | 5,032 |
| Charlton..... | 1,060 | 2,154 | 2 | 217,193 | 543 |
| Chatham..... | 400 | 45,023 | 113 | 17,672,222 | 16,672 |
| Chattahoochee..... | 220 | 5,670 | 26 | 504,418 | 2,293 |
| Chattooga..... | 400 | 10,021 | 25 | 1,452,245 | 3,630 |
| Cherokee..... | 470 | 14,325 | 30 | 1,692,209 | 3,600 |
| Clarke..... | 180 | 11,702 | 65 | 4,430,265 | 24,613 |
| Clay..... | 200 | 6,650 | 33 | 760,121 | 3,800 |
| Clayton..... | 140 | 8,027 | 57 | 1,225,891 | 8,756 |
| Clinch..... | 900 | 4,138 | 5 | 666,053 | 751 |
| Cobb..... | 400 | 20,748 | 52 | 3,338,479 | 8,346 |
| Coffee..... | 980 | 5,070 | 5 | 797,548 | 814 |
| Colquitt..... | 550 | 2,527 | 5 | 294,634 | 535 |
| Columbia..... | 290 | 10,465 | 36 | 892,405 | 3,077 |
| Coweta..... | 440 | 21,100 | 48 | 2,963,015 | 6,734 |
| Crawford..... | 340 | 8,656 | 25 | 712,334 | 2,095 |
| Dade..... | 180 | 4,702 | 26 | 691,392 | 3,846 |
| Dawson..... | 180 | 5,837 | 32 | 567,601 | 3,153 |
| Decatur..... | 1,160 | 19,072 | 16 | 2,025,725 | 1,746 |
| DeKalb..... | 280 | 14,497 | 52 | 2,372,986 | 8,475 |
| Dodge..... | 580 | 5,538 | 9 | 681,244 | 1,174 |
| Dooley..... | 780 | 12,420 | 16 | 1,328,229 | 1,703 |
| Dougherty..... | 340 | 12,622 | 37 | 2,398,514 | 7,054 |
| Douglas..... | 190 | 6,934 | 36 | 697,462 | 3,671 |
| Early..... | 510 | 7,611 | 15 | 805,308 | 1,579 |
| Echols..... | 400 | 2,553 | 6 | 244,896 | 608 |

TABLE No. 1.—*Continued.*

| COUNTIES. | AREA. | POPULATION. | | WEALTH. | |
|-----------------|------------|-------------|--------------|------------|---------------|
| | Sq. Miles. | Total. | Per Sq. Mile | Total. | Per Sq. Mile. |
| Effingham..... | 420 | 5,979 | 14 | 640,795 | 1,526 |
| Elbert..... | 440 | 12,957 | 29 | 1,344,549 | 3,055 |
| Emanuel..... | 1,040 | 9,759 | 9 | 1,247,171 | 1,200 |
| Fannin..... | 390 | 7,245 | 19 | 432,883 | 1,109 |
| Fayette..... | 220 | 8,605 | 39 | 863,768 | 3,926 |
| Floyd..... | 540 | 24,418 | 45 | 5,193,583 | 9,614 |
| Forsyth..... | 250 | 10,599 | 42 | 1,227,243 | 4,908 |
| Franklin..... | 330 | 11,453 | 35 | 1,227,647 | 3,720 |
| Fulton..... | 200 | 49,137 | 246 | 20,343,525 | 101,717 |
| Gilmer..... | 480 | 8,386 | 17 | 557,047 | 1,160 |
| Glascock..... | 100 | 3,577 | 36 | 415,153 | 4,153 |
| Glynn..... | 430 | 6,497 | 15 | 1,170,644 | 2,722 |
| Gordon..... | 360 | 11,171 | 31 | 1,826,924 | 5,075 |
| Green..... | 340 | 17,547 | 52 | 2,092,354 | 6,154 |
| Gwinnett..... | 470 | 19,531 | 42 | 2,405,689 | 5,116 |
| Habersham..... | 400 | 8,718 | 22 | 834,939 | 2,087 |
| Hall..... | 540 | 15,298 | 28 | 2,074,198 | 3,841 |
| Hancock..... | 520 | 16,989 | 33 | 2,367,398 | 4,553 |
| Haralson..... | 330 | 5,976 | 18 | 630,249 | 1,910 |
| Harris..... | 470 | 15,758 | 34 | 1,790,073 | 3,806 |
| Hart..... | 330 | 9,094 | 28 | 986,781 | 2,990 |
| Heard..... | 290 | 8,769 | 30 | 933,510 | 3,225 |
| Henry..... | 400 | 14,193 | 35 | 1,647,632 | 4,119 |
| Houston..... | 560 | 22,414 | 40 | 2,297,564 | 4,103 |
| Irwin..... | 680 | 2,696 | 4 | 516,515 | 760 |
| Jackson..... | 360 | 16,297 | 45 | 1,780,172 | 4,923 |
| Jasper..... | 380 | 11,851 | 31 | 1,133,495 | 2,983 |
| Jefferson..... | 620 | 15,671 | 25 | 2,066,606 | 3,349 |
| Johnson..... | 260 | 4,800 | 18 | 531,202 | 2,043 |
| Jones..... | 470 | 11,613 | 25 | 1,098,849 | 2,338 |
| Laurens..... | 740 | 10,053 | 14 | 1,051,931 | 1,308 |
| Lee..... | 360 | 10,577 | 29 | 979,310 | 2,726 |
| Liberty..... | 720 | 10,649 | 15 | 888,193 | 1,233 |
| Lincoln..... | 280 | 6,412 | 23 | 671,733 | 2,400 |
| Lowndes..... | 470 | 11,049 | 24 | 1,298,606 | 2,720 |
| Lumpkin..... | 290 | 6,526 | 23 | 539,309 | 1,860 |
| McDuffie..... | 330 | 9,440 | 29 | 805,453 | 2,441 |
| McIntosh..... | 530 | 6,241 | 12 | 725,358 | 1,365 |
| Macon..... | 360 | 11,675 | 32 | 1,327,807 | 3,678 |
| Madison..... | 300 | 7,978 | 27 | 882,843 | 2,943 |
| Marion..... | 360 | 8,598 | 24 | 859,588 | 2,388 |
| Meriwether..... | 490 | 17,651 | 36 | 1,503,662 | 3,068 |
| Miller..... | 240 | 3,720 | 16 | 324,027 | 1,392 |
| Milton..... | 110 | 6,261 | 57 | 840,992 | 7,643 |
| Mitchell..... | 500 | 9,392 | 19 | 1,193,900 | 2,388 |
| Monroe..... | 470 | 18,808 | 40 | 2,199,282 | 4,680 |
| Montgomery..... | 720 | 5,381 | 7 | 730,631 | 1,015 |
| Morgan..... | 400 | 14,032 | 35 | 2,090,611 | 5,226 |
| Murray..... | 420 | 8,269 | 20 | 1,074,565 | 2,558 |
| Muscogee..... | 210 | 19,322 | 92 | 7,634,875 | 36,356 |
| Newton..... | 260 | 13,623 | 52 | 2,024,025 | 7,515 |
| Oconee..... | 160 | 6,351 | 40 | 777,935 | 4,862 |
| Oglethorpe..... | 510 | 15,400 | 30 | 1,601,480 | 3,140 |

TABLE No. 1.—*Continued.*

| COUNTIES. | AREA. | POPULATION. | | WEALTH. | |
|-----------------|-----------|-------------|---------------|--------------|---------------|
| | Sq. Mile. | Total. | Per Sq. Mile. | Total. | Per Sq. Mile. |
| Paulding..... | 340 | 10,887 | 32 | \$ 1,210,841 | \$3,561 |
| Pickens..... | 230 | 6, 90 | 30 | 528,469 | 2,297 |
| Pierce..... | 540 | 4,538 | 8 | 544,283 | 1,008 |
| Pike..... | 290 | 15,849 | 55 | 2,357,048 | 8,128 |
| Polk..... | 330 | 11,952 | 36 | 1,673,805 | 5,072 |
| Pulaski..... | 470 | 14,058 | 30 | 1,566,227 | 3,332 |
| Putnam..... | 360 | 14,539 | 40 | 1,682,656 | 4,674 |
| Quitman..... | 160 | 4,392 | 27 | 586,078 | 3,664 |
| Rabun..... | 400 | 4,634 | 12 | 316,177 | 790 |
| Randolph..... | 400 | 13,341 | 33 | 1,642,044 | 4,105 |
| Richmond..... | 320 | 34,665 | 108 | 15,328,452 | 47,901 |
| Rockdale..... | 120 | 6,838 | 57 | 1,160,995 | 9,674 |
| Schley..... | 180 | 5,302 | 29 | 553,483 | 3,075 |
| Screven..... | 720 | 12,786 | 18 | 1,081,722 | 1,502 |
| Spaulding..... | 220 | 12,585 | 57 | 2,017,879 | 9,172 |
| Stewart..... | 440 | 13,998 | 32 | 1,454,896 | 3,307 |
| Sumter..... | 520 | 18,229 | 35 | 2,991,898 | 5,754 |
| Talbot..... | 360 | 14,115 | 39 | 1,264,018 | 3,511 |
| Taliaferro..... | 180 | 7,039 | 39 | 684,080 | 3,800 |
| Tatnall..... | 1,100 | 6,988 | 6 | 930,300 | 846 |
| Taylor..... | 400 | 8,597 | 21 | 815,213 | 2,038 |
| Telfair..... | 420 | 4,828 | 11 | 658,682 | 1,568 |
| Terrell..... | 320 | 10,451 | 33 | 1,276,405 | 3,988 |
| Thomas..... | 780 | 20,597 | 26 | 2,536,419 | 3,252 |
| Towns..... | 180 | 3,261 | 18 | 248,277 | 1,379 |
| Troup..... | 430 | 20,565 | 48 | 2,983,851 | 6,939 |
| Twiggs..... | 330 | 8,918 | 27 | 653,647 | 1,981 |
| Union..... | 330 | 6,431 | 19 | 429,570 | 1,302 |
| Upson..... | 310 | 12,400 | 40 | 1,444,657 | 4,660 |
| Walker..... | 440 | 11,056 | 25 | 1,753,891 | 3,986 |
| Walton..... | 400 | 15,623 | 39 | 2,362,910 | 5,907 |
| Ware..... | 620 | 4,159 | 7 | 550,615 | 888 |
| Warren..... | 290 | 10,885 | 38 | 1,214,270 | 4,187 |
| Washington..... | 680 | 21,964 | 32 | 2,806,251 | 4,127 |
| Wayne..... | 740 | 5,980 | 8 | 670,978 | 907 |
| Webster..... | 230 | 5,237 | 23 | 625,786 | 2,721 |
| White..... | 180 | 5,341 | 30 | 479,899 | 2,666 |
| Whitfield..... | 330 | 11,900 | 36 | 1,920,990 | 5,821 |
| Wilcox..... | 500 | 3,109 | 6 | 402,572 | 805 |
| Wilkes..... | 460 | 15,985 | 35 | 2,785,087 | 6,154 |
| Wilkins..... | 440 | 12,061 | 27 | 1,209,195 | 2,748 |
| Worth..... | 710 | 5,892 | 8 | 623,345 | 878 |

TABLE No. II.

Population and Wealth of Georgia by Race (White and Colored), and Per Capita, by Census of 1880.

| | POPULATION. | | | | WEALTH. | | Per Capita. | |
|--------------------|-------------|----------|-----------|-------|---------------|-------------|-------------|-------|
| | White. | Colored. | Per Cent. | | White. | Colored. | White Col d | |
| | | | White | Col d | | | White | Col d |
| The State..... | 816,906 | 725,133 | 53 | 47 | \$233,708,306 | \$5,764,293 | 286 | 8 |
| COUNTIES. | | | | | | | | |
| Appling..... | 4,084 | 1,192 | 77 | 23 | 799,523 | 12,793 | 187 | 11 |
| Baker..... | 1,742 | 5,565 | 24 | 76 | 552,203 | 38,680 | 337 | 7 |
| Baldwin..... | 4,512 | 9,294 | 33 | 67 | 1,092,024 | 53,940 | 246 | 6 |
| Banks..... | 5,830 | 1,507 | 80 | 20 | 821,750 | 20,990 | 133 | 13 |
| Bartow..... | 12,419 | 6,271 | 66 | 34 | 3,207,936 | 51,854 | 254 | 8 |
| Berrien..... | 5,783 | 836 | 88 | 12 | 936,729 | 5,511 | 156 | 7 |
| Bibb..... | 11,429 | 15,700 | 42 | 58 | 8,503,904 | 255,558 | 750 | 16 |
| Brooks..... | 5,670 | 6,057 | 48 | 52 | 1,774,342 | 58,202 | 313 | 10 |
| Bryan..... | 2,368 | 2,561 | 48 | 52 | 403,869 | 24,220 | 171 | 9 |
| Bullock..... | 5,797 | 2,256 | 72 | 28 | 1,026,080 | 29,318 | 170 | 11 |
| Burke..... | 6,089 | 21,031 | 22 | 78 | 2,145,269 | 163,248 | 372 | 8 |
| Butts..... | 4,277 | 4,034 | 51 | 49 | 845,030 | 20,889 | 197 | 5 |
| Calhoun..... | 2,354 | 4,670 | 33 | 67 | 648,523 | 28,287 | 283 | 6 |
| Camden..... | 2,091 | 4,092 | 34 | 66 | 577,472 | 41,737 | 276 | 11 |
| Campbell..... | 6,085 | 3,885 | 61 | 39 | 1,415,494 | 33,515 | 230 | 9 |
| Carroll..... | 14,591 | 2,310 | 87 | 13 | 1,970,173 | 17,515 | 130 | 8 |
| Catoosa..... | 4,127 | 612 | 88 | 12 | 804,702 | 5,413 | 189 | 9 |
| Charlton..... | 1,794 | 360 | 83 | 17 | 212,905 | 4,288 | 109 | 12 |
| Chatham..... | 17,494 | 17,515 | 39 | 61 | 1,772,024 | 200,148 | 994 | 7 |
| Chattahoochee..... | 2,130 | 3,540 | 37 | 63 | 484,933 | 19,483 | 231 | 6 |
| Chattooga..... | 7,981 | 2,040 | 80 | 20 | 1,434,159 | 18,086 | 173 | 9 |
| Cherokee..... | 12,699 | 1,626 | 88 | 12 | 1,672,324 | 19,875 | 121 | 12 |
| Clarke..... | 5,313 | 6,388 | 45 | 55 | 4,289,629 | 140,636 | 812 | 22 |
| Clay..... | 2,798 | 3,852 | 42 | 58 | 738,314 | 21,807 | 275 | 6 |
| Clayton..... | 4,938 | 3,089 | 62 | 38 | 1,209,685 | 16,206 | 245 | 5 |
| Clinch..... | 3,300 | 838 | 80 | 20 | 663,878 | 2,175 | 201 | 3 |
| Cobb..... | 14,734 | 6,012 | 71 | 29 | 3,287,889 | 50,590 | 224 | 8 |
| Coffee..... | 4,028 | 1,042 | 80 | 20 | 775,450 | 22,098 | 192 | 21 |
| Colquitt..... | 2,422 | 105 | 96 | 4 | 293,659 | 975 | 121 | 9 |
| Columbia..... | 3,030 | 7,435 | 29 | 71 | 846,170 | 46,235 | 280 | 6 |
| Coweta..... | 9,305 | 11,797 | 44 | 56 | 2,899,615 | 63,400 | 311 | 5 |
| Crawford..... | 3,940 | 4,716 | 45 | 55 | 684,154 | 28,180 | 173 | 6 |
| Dade..... | 3,618 | 1,084 | 77 | 23 | 688,621 | 2,771 | 190 | 3 |
| Dawson..... | 5,479 | 356 | 94 | 6 | 563,924 | 3,677 | 103 | 10 |
| Decatur..... | 8,889 | 10,183 | 46 | 54 | 1,919,193 | 106,532 | 216 | 11 |
| DeKalb..... | 9,954 | 4,533 | 69 | 31 | 2,339,778 | 33,200 | 236 | 8 |
| Dodge..... | 3,506 | 1,852 | 65 | 35 | 665,878 | 15,366 | 190 | 8 |
| Dooley..... | 6,592 | 5,828 | 53 | 47 | 1,286,356 | 41,873 | 192 | 7 |
| Dougherty..... | 1,952 | 10,670 | 15 | 85 | 2,298,412 | 100,102 | 174 | 10 |
| Douglas..... | 5,463 | 1,471 | 79 | 21 | 683,129 | 14,334 | 125 | 10 |
| Early..... | 3,015 | 4,596 | 40 | 60 | 765,548 | 39,760 | 253 | 9 |
| Echols..... | 2,053 | 500 | 86 | 20 | 241,306 | 3,590 | 118 | 7 |
| Effingham..... | 3,228 | 2,751 | 54 | 46 | 623,539 | 17,256 | 193 | 6 |
| Elbert..... | 6,085 | 6,872 | 47 | 53 | 1,294,953 | 49,646 | 212 | 7 |
| Emanuel..... | 6,660 | 3,085 | 68 | 31 | 1,214,041 | 33,130 | 182 | 11 |
| Fannin..... | 7,112 | 133 | 98 | 2 | 442,393 | 430 | 61 | 3 |

TABLE No. II—*Continued.*

| | POPULATION. | | | | WEALTH. | | Per Capita | |
|------------------|-------------|----------|-----------|-------|------------|----------|------------|-------|
| | White. | Colored. | Per Cent. | | White. | Colored. | | |
| | | | White | Col'd | | | White | Col'd |
| Fayette | 5,742 | 2,863 | 67 | 33 | 839,496 | 24,272 | 146 | 9 |
| Floyd | 14,958 | 9,460 | 61 | 39 | 5,105,403 | 88,180 | 340 | 9 |
| Forsyth | 9,072 | 1,487 | 86 | 14 | 1,208,951 | 18,292 | 133 | 13 |
| Franklin | 8,906 | 2,547 | 77 | 23 | 1,209,294 | 18,353 | 136 | 7 |
| Fulton | 28,295 | 20,842 | 57 | 43 | 20,061,750 | 281,775 | 709 | 14 |
| Gilmer | 8,258 | 126 | 98 | 2 | 554,815 | 2,232 | 67 | 18 |
| Glascocock | 2,506 | 1,071 | 70 | 30 | 409,063 | 6,090 | 163 | 6 |
| Glynn | 2,195 | 4,300 | 36 | 64 | 1,112,202 | 58,442 | 505 | 14 |
| Gordon | 9,347 | 1,820 | 83 | 17 | 2,069,133 | 23,221 | 221 | 13 |
| Green | 5,573 | 11,974 | 32 | 67 | 1,767,044 | 59,880 | 317 | 5 |
| Gwinnett | 16,016 | 3,515 | 82 | 18 | 2,373,182 | 32,507 | 148 | 9 |
| Habersham | 7,357 | 1,361 | 84 | 16 | 825,957 | 8,982 | 112 | 7 |
| Hall | 13,040 | 2,585 | 85 | 15 | 2,058,041 | 16,157 | 158 | 8 |
| Hancock | 5,044 | 11,943 | 29 | 71 | 2,310,506 | 56,892 | 458 | 5 |
| Haralson | 5,821 | 153 | 97 | 3 | 627,932 | 2,317 | 108 | 15 |
| Harris | 6,450 | 9,286 | 41 | 59 | 1,729,527 | 60,546 | 283 | 7 |
| Hart | 6,212 | 2,882 | 63 | 32 | 960,259 | 26,522 | 156 | 9 |
| Heard | 5,674 | 3,095 | 64 | 36 | 910,510 | 23,030 | 161 | 8 |
| Henry | 7,961 | 6,229 | 56 | 44 | 1,610,494 | 37,138 | 202 | 6 |
| Houston | 6,024 | 16,390 | 27 | 73 | 2,189,109 | 108,445 | 364 | 7 |
| Irwin | 2,161 | 535 | 80 | 20 | 503,487 | 13,028 | 233 | 24 |
| Jackson | 11,139 | 5,157 | 68 | 32 | 1,742,662 | 37,510 | 156 | 7 |
| Jasper | 4,258 | 7,593 | 36 | 64 | 1,092,956 | 40,639 | 256 | 5 |
| Jefferson | 5,581 | 10,090 | 35 | 65 | 1,985,860 | 80,746 | 356 | 8 |
| Johnson | 3,455 | 1,345 | 72 | 28 | 518,845 | 12,357 | 150 | 9 |
| Jones | 3,753 | 7,800 | 32 | 68 | 1,045,080 | 53,769 | 276 | 7 |
| Laurens | 5,702 | 4,350 | 57 | 43 | 1,011,243 | 40,588 | 177 | 9 |
| Lee | 1,739 | 8,837 | 16 | 84 | 920,657 | 58,653 | 529 | 7 |
| Liberty | 3,581 | 7,061 | 34 | 66 | 817,230 | 70,963 | 278 | 10 |
| Lincoln | 2,254 | 4,158 | 35 | 65 | 654,887 | 16,846 | 291 | 4 |
| Lowndes | 5,412 | 5,637 | 49 | 51 | 1,248,203 | 50,903 | 231 | 9 |
| Lumpkin | 6,075 | 451 | 94 | 6 | 535,210 | 4,094 | 88 | 9 |
| McDuffie | 3,430 | 6,019 | 36 | 64 | 778,173 | 27,289 | 227 | 5 |
| McIntosh | 1,546 | 4,695 | 25 | 75 | 649,311 | 76,047 | 418 | 16 |
| Macon | 4,288 | 7,387 | 37 | 63 | 1,293,303 | 34,504 | 301 | 5 |
| Madison | 5,392 | 2,586 | 67 | 33 | 857,863 | 24,980 | 159 | 9 |
| Marion | 4,294 | 4,304 | 50 | 50 | 834,439 | 25,149 | 194 | 6 |
| Meriwether | 7,797 | 9,854 | 44 | 56 | 1,456,248 | 47,414 | 182 | 5 |
| Miller | 2,327 | 1,393 | 63 | 37 | 320,378 | 13,643 | 139 | 10 |
| Milton | 5,484 | 777 | 87 | 13 | 830,349 | 10,643 | 151 | 14 |
| Mitchell | 4,189 | 5,203 | 45 | 55 | 1,141,265 | 52,631 | 272 | 10 |
| Monroe | 6,693 | 12,115 | 36 | 64 | 2,135,560 | 63,722 | 316 | 5 |
| Montgomery | 3,510 | 1,871 | 65 | 35 | 707,320 | 23,311 | 202 | 13 |
| Morgan | 4,219 | 9,802 | 30 | 70 | 2,023,930 | 66,631 | 476 | 7 |
| Murphy | 7,362 | 906 | 88 | 12 | 1,066,271 | 8,294 | 145 | 9 |
| Muscogee | 8,995 | 10,327 | 46 | 54 | 7,495,810 | 139,064 | 833 | 14 |
| Newton | 6,740 | 6,883 | 49 | 51 | 1,973,825 | 50,200 | 293 | 7 |
| Oconee | 3,327 | 3,024 | 52 | 48 | 755,836 | 22,099 | 227 | 7 |
| Oglethorpe | 5,469 | 9,931 | 35 | 65 | 1,545,510 | 55,970 | 282 | 6 |
| Paulding | 9,903 | 984 | 91 | 9 | 1,196,809 | 14,032 | 121 | 14 |
| Pickens | 6,645 | 145 | 98 | 2 | 524,784 | 3,685 | 79 | 25 |

TABLE No. II—*Continued.*

| | POPULATION. | | | | WEALTH. | | | |
|-----------------|-------------|----------|-----------|-------|------------|----------|-------------|-------|
| | White. | Colored. | Per Cent. | | White. | Colored. | Per Capita. | |
| | | | White | Col'd | | | White | Col'd |
| Pierce..... | 3,055 | 1,472 | 70 | 30 | 532,370 | 11,913 | 173 | 8 |
| Pike..... | 7,780 | 8,069 | 49 | 51 | 2,296,207 | 60,841 | 295 | 8 |
| Polk..... | 7,805 | 4,147 | 65 | 35 | 1,637,089 | 35,716 | 210 | 9 |
| Pulaski..... | 5, 24 | 8,225 | 41 | 59 | 1,505,467 | 60,760 | 260 | 3 |
| Putnam..... | 3,518 | 11,021 | 24 | 76 | 1,624,722 | 57,934 | 462 | 5 |
| Quitman..... | 1,773 | 2,619 | 40 | 60 | 559,436 | 26,642 | 316 | 10 |
| Rabun..... | 4,437 | 197 | 96 | 4 | 315,256 | 921 | 71 | 5 |
| Randolph..... | 5,545 | 7,796 | 42 | 58 | 1,598,814 | 43,270 | 288 | 6 |
| Richmond..... | 17,185 | 17,464 | 49 | 51 | 15,062,552 | 265,900 | 875 | 16 |
| Rockdale..... | 4,149 | 2,689 | 61 | 39 | 1,192,058 | 18,937 | 275 | 7 |
| Schley..... | 2,229 | 3,073 | 42 | 58 | 528,620 | 24,86 | 237 | 8 |
| Screven..... | 6,173 | 6,613 | 45 | 55 | 1,031,548 | 50,174 | 162 | 8 |
| Spalding..... | 5,439 | 7,146 | 43 | 57 | 1,957,140 | 60,739 | 360 | 9 |
| Stewart..... | 4,376 | 9,622 | 31 | 69 | 1,399,829 | 55,067 | 317 | 6 |
| Sumter..... | 6,050 | 12,189 | 33 | 67 | 2,893,250 | 98,448 | 478 | 8 |
| Talbot..... | 4,448 | 9,667 | 32 | 68 | 1,214,341 | 49,677 | 273 | 5 |
| Taliaferro..... | 2,312 | 4,722 | 33 | 67 | 650,021 | 34,059 | 281 | 7 |
| Tatnall..... | 5,014 | 1,974 | 71 | 29 | 904,896 | 25,463 | 181 | 13 |
| Taylor..... | 4,770 | 3,872 | 55 | 45 | 787,025 | 17,188 | 165 | 5 |
| Telfair..... | 2,666 | 2,161 | 55 | 45 | 647,507 | 11,175 | 248 | 5 |
| Terrell..... | 4,268 | 6,183 | 41 | 59 | 1,232,032 | 44,373 | 288 | 7 |
| Thomas..... | 8,384 | 12,213 | 41 | 59 | 2,435,533 | 100,886 | 291 | 9 |
| Towns..... | 3,157 | 101 | 97 | 3 | 247,072 | 1,205 | 78 | 12 |
| Troup..... | 6,595 | 13,970 | 32 | 68 | 2,930,413 | 53,438 | 444 | 4 |
| Twiggs..... | 2,844 | 6,074 | 32 | 68 | 615,815 | 37,835 | 217 | 6 |
| Union..... | 6,321 | 110 | 98 | 2 | 429,363 | 206 | 68 | 2 |
| Upson..... | 6,133 | 6,267 | 49 | 51 | 1,410,661 | 33,996 | 230 | 6 |
| Walker..... | 9,492 | 563 | 86 | 14 | 1,739,514 | 14,377 | 183 | 26 |
| Walton..... | 9,321 | 6,301 | 60 | 40 | 2,315,998 | 46,912 | 250 | 8 |
| Ware..... | 3,017 | 1,144 | 72 | 28 | 538,051 | 12,564 | 179 | 11 |
| Warren..... | 4,039 | 6,846 | 37 | 63 | 1,204,179 | 10,091 | 300 | 2 |
| Washington..... | 9,449 | 12,515 | 43 | 57 | 2,713,692 | 92,559 | 287 | 8 |
| Wayne..... | 4,060 | 1,920 | 68 | 32 | 661,609 | 9,369 | 163 | 5 |
| Webster..... | 2,667 | 2,570 | 51 | 49 | 611,642 | 14,644 | 229 | 6 |
| White..... | 4,751 | 590 | 90 | 10 | 475,247 | 4,652 | 100 | 8 |
| Whitfield..... | 9,689 | 2,210 | 81 | 19 | 1,901,171 | 19,819 | 195 | 9 |
| Wilcox..... | 2,411 | 698 | 77 | 23 | 394,124 | 8,448 | 164 | 13 |
| Wilkes..... | 5,173 | 10,812 | 32 | 68 | 2,712,645 | 72,442 | 525 | 7 |
| Wilkinson..... | 6,550 | 5,511 | 54 | 46 | 1,175,150 | 34,045 | 179 | 6 |
| Worth..... | 4,068 | 1,824 | 69 | 31 | 606,198 | 19,147 | 150 | 10 |

NOTE.—The valuations in the Tables are derived from the Census of 1880; and these were taken from the Comptroller General's Report, being the State Assessment for Taxation. The true wealth of Georgia, and of each county, is estimated much higher. To illustrate: By the assessment the wealth of the United States is but 17 billions; by the estimate, the true wealth exceeds 43 billions. The assessment is but 40 per cent. of the true value. In Georgia, the assessed value is 240 millions; the true is estimated at 606 millions.

TABLE No. III.

The State, its Sections and its Counties, Compared as to Area, Population and Wealth, by Race and Per Capita, 1880.

| | AREA. | POPULATION | | | | WEALTH. | | | |
|-------------------------|--------|------------|----------|-----------|---------|-------------|-----------|------------|---------|
| | | White. | Colored. | Per Cent. | | White. | Colored. | Per Capita | |
| | | | | White. | Colored | | | White. | Colored |
| The State, 137 Counties | 8,980 | 816,906 | 725,133 | 53 | 47 | 233,708,306 | 5,764,293 | \$286 | \$ 8 |
| SECTIONS. | | | | | | | | | |
| North Georgia, 33 " | 11,260 | 270,616 | 64,180 | 81 | 19 | 43,994,496 | 591,573 | 160 | 9 |
| Middle Georgia, 40 " | 13,060 | 256,558 | 307,739 | 46 | 54 | 89,539,291 | 2,254,153 | 349 | 7 |
| Southwest Ga., 32 " | 14,350 | 123,234 | 183,245 | 40 | 60 | 41,405,522 | 1,438,134 | 335 | 8 |
| East Georgia, 17 " | 10,470 | 98,511 | 107,489 | 43 | 57 | 32,340,223 | 977,160 | 328 | 9 |
| Southeast Ga., 15 " | 9,840 | 57,912 | 61,443 | 49 | 51 | 26,080,739 | 567,603 | 450 | 9 |
| SUB-SECTIONS. | | | | | | | | | |
| Northwest Ga., 18 " | 6,400 | 157,454 | 39,069 | 80 | 20 | 28,778,892 | 372,525 | 183 | 10 |
| Northeast Ga., 15 " | 4,860 | 113,165 | 25,111 | 82 | 18 | 14,624,031 | 219,048 | 130 | 9 |
| West Middle Ga., 24 " | 7,600 | 189,477 | 179,660 | 51 | 49 | 64,943,942 | 1,429,809 | 343 | 8 |
| East Middle Ga., 16 " | 5,460 | 67,081 | 128,079 | 34 | 66 | 24,595,349 | 824,344 | 367 | 7 |
| Northern Tier, 16 " | 4,990 | 102,416 | 11,929 | 90 | 10 | 12,537,000 | 65,000 | 122 | 6 |
| Second Tier, 17... " | 6,270 | 169,666 | 52,261 | 75 | 25 | 30,866,000 | 497,000 | 181 | 10 |
| Average of State.... | 470 | 5,964 | 5,297 | 53 | 47 | 1,702,425 | 42,075 | 286 | 8 |
| " North Georgia.. | 341 | 8,200 | 1,945 | 81 | 19 | 1,333,200 | 18,000 | 160 | 9 |
| " Middle Georgia.. | 424 | 6,414 | 7,693 | 46 | 54 | 2,276,965 | 56,334 | 349 | 7 |
| " Southwest Ga.. | 446 | 3,851 | 5,879 | 40 | 60 | 1,293,922 | 43,600 | 335 | 8 |
| " East Ga. | 616 | 5,795 | 6,330 | 43 | 57 | 1,902,366 | 54,634 | 328 | 9 |
| " Southeast Ga. | 656 | 3,861 | 4,139 | 49 | 51 | 1,735,160 | 37,840 | 450 | 9 |

The State and its Sections Compared in Sundry Particulars.

| | Counties. | Per Cent. of Area. | Pr. Ct. of Population. | | | Pr. Ct. of Wealth | | | Wealth pr capita. | | |
|-------------------------|-----------|--------------------|------------------------|--------|---------|-------------------|-------|---------|-------------------|-------------|--------|
| | | | Total | White. | Colored | Total | White | Colored | Total. | Per cent of | |
| | | | | | | | | | | Total | White. |
| The State.... | 137 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 155 | 100 | 100 |
| North Georgia | 33 | 19 | 22 | 33 | 9 | 8 | 19 | 10 | 132 | 85 | 56 |
| Middle Georgia..... | 40 | 22 | 37 | 32 | 42 | 38 | 38 | 39 | 162 | 105 | 122 |
| Southwest Georgia..... | 32 | 24 | 20 | 15 | 25 | 18 | 18 | 25 | 138 | 89 | 117 |
| East Georgia..... | 17 | 18 | 13 | 12 | 15 | 14 | 14 | 17 | 161 | 104 | 111 |
| Southeast Georgia | 15 | 16 | 8 | 7 | 8 | 11 | 11 | 9 | 232 | 148 | 157 |

NOTE.—The Counties forming the Southern tier, nine in number, are large in area, averaging 700 square miles. Small in population; averaging about 9,000; and below average in wealth; about \$1,100 000 each.

Since 1860, great changes have occurred in the rank of counties, as to wealth. Fulton, which now heads the list then stood as No. 21. Wilkes county being No. 20. The large agricultural counties then had a higher relative stand than they now have. Troup, No. 4; Houston, 6; Monroe, 7; Burke, 8; Meriwether, 9; Talbot, 10; Stewart, 11, in order of wealth.

RELATIVE INCREASE OF WHITES AND BLACKS IN
THE UNION AND AT THE SOUTH.

SENSATIONAL ESTIMATES—GREAT MISTAKES CORRECTED.

The magazines and newspapers have abounded of late with estimates of a supposed enormous future increase of the negro race as compared with the white. It is represented that the country is about to be Africanized, and especially that the Southern tier of States, including Georgia, is doomed to this fate. Even a book has been written on the subject. These *enormous estimates* put the colored population one hundred years hence at about 200,000,000, *i. e.*, at *four times* the whole present population, white and colored, of the Union. They consign six or eight colored Southern States to 120,000,000 of blacks, overshadowing 30,000,000 of whites, if, indeed, the whites do not quit the country.

The value of these estimates may be illustrated by an expression of Mr. Webster's. On one occasion he was met, it is said, by the Austrian Minister with a formidable complaint of some imagined grievance, to which Mr. Webster responded: "Well, Mr. Hulsemann, you've found a 'MARE'S NEST,' repeating, in rather a merry, sing-song way, (it being after dinner) "Well, Mr. Hulsemann, you've found a *mare's nest*."

Even such a discovery has been made by Judge Tourgee and others; they do not, however, overestimate the importance of their discovery, if it be a genuine nest. But is it true in fact? Not at all. Neither the country nor the South is in any such danger. A great fabric of delusions is based on errors in the census of 1870, errors admitted in the census abstract and palpable enough even on their face. Based on this false foundation, the calculations, such as they are, run on this wise: By the census of 1870 (assumed to be correct) the colored population of the United States

was 4,880,000; by that of 1880, 6,518,372, showing an increase of 1,638,363, or 33 1-2 per cent. Hence the easy calculation.

THE FALSE COUNT.

| | Colored population of;
United States. | Eight doomed
Southern States. | Doomed
Georgia. |
|-----------|------------------------------------------|----------------------------------|--------------------|
| 1880----- | 6,500,000 | 4,350,000 | 725,000 |
| 1900----- | 13,000,000 | 8,700,000 | 1,450,000 |
| 1920----- | 26,000,000 | 17,400,000 | 2,900,000 |
| 1940----- | 52,000,000 | 34,800,000 | 5,800,000 |
| 1960----- | 104,000,000 | 69,600,000 | 11,600,000 |
| 1980----- | 208,000,000 | 139,200,000 | 23,200,000 |
| 2000----- | 416,000,000 | 278,400,000 | 46,400,000 |

On this basis the United States will contain one hundred years hence more Africans than Africa herself. The children of persons now living will live to see the eight doomed States of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi and Louisiana (in the year 2000) with 278,000,000 of blacks. Georgia herself, in the year 2000, at this rate, would have a colored population of 46,000,000, exceeding the present white population of the Union. A black prospect! True, these figures are a little startling; but why should we doubt the census? Mr. Pickwick's confidence in science was never chilled by unexpected or amazing results. It is a little surprising, however, that such astonishing results did not wake up some slight suspicions, and call a little common sense to the rescue.

To pass, however, from these wild figures and sensational conclusions, let us study the real data and

THE PROBABLE TRUTH

as to the future increase of the negro race. We must judge of the future by the past. Our means of estimating the future population of the country are to be found in the ten census reports, from 1790 to 1880, not in any two of them, but in them all. These reports are valuable guides, if cautiously used, so long as conditions remain unchanged. Judging by these data, what is the probable future increase of the colored population? Take the experience of ninety years, first, as a *whole*. The colored population has increased from 757,203 in 1790 to 6,518,372 in 1880. Allowing for additions

made by the slave trade till 1808—and by the admission of Florida, Louisiana and Texas—the increase was 7.61 fold. At this rate the number ninety years hence, in 1970, would be below 50,000,000 in the Union instead of over 100,000,000 in seven States.

But the successive returns show a diminishing rate of increase, in successive periods. Take the rate between 1860 and 1880 as a basis, and the number one hundred years hence, in 1980, would fall short of 45,000,000. But a careful comparison of the returns shows even this estimate to be too high. We should endeavor to get the

RUN OF THE CENSUS

as a basis. Should the successive rates of decrease in ratio be the same for the next one hundred years as in the last ninety, the population would be about as follows :

| Year. | Colored pop. |
|--------------------------------------|--------------|
| 1900 at 41 per cent in 20 years..... | 9,200,000 |
| 1920 at 35 per cent..... | 12,400,000 |
| 1940 at 30 per cent..... | 16,100,000 |
| 1960 at 25 per cent..... | 20,150,000 |
| 1980 at 20 per cent..... | 24,200,000 |
| 2000 at 17 per cent..... | 28,500 000 |

These estimates are at a less rate of decline in ratio than in the past series of like periods of twenty years. It is probably in excess, even if conditions remain unchanged.

Let us correct the error in the census of 1870 and see the *general run* of the recent enumerations: The return of 1860 showed a colored population of 4,441,830; that of 1880, 6,518,372, making an increase in twenty years of 46 $\frac{1}{2}$ per cent. If the rate of increase was uniform, then in ten years it was 21.14 nearly. At this rate the population of 1870 would be 5,380,000. An increase over that of 1860 of 938,000; increase from 1870 to 1880, 1,138,000

An allowance needs to be made in 1850. The increment between 1840 and 1850 was affected by 58,000 colored persons admitted into Texas. The 765,000 increment of that decade is therefore reduced to 707,000 of natural increase. Observe now the successive increments for a number of successive decades, beginning with 1850, expressed in thousands: 707: 803; 938; 1138.

DEPARTMENT OF AGRICULTURE.

This looks like a reasonable run. But as presented in the census of 1870 the increment for that decade was but 438, and for the next decade 1638, making the run read thus; 707; 803; 438; 1638. This is wrong on its face. One decade is not much over half of the preceding and not much over one-fourth of the succeeding one—an incredible run.

Compare next the successive rates per cent of increase for periods of twenty years, beginning with 1790, 1810, 1830, etc. They run thus: 82; 69; 56; 34; too small. Begin with 1800, 1820, etc.: 76; 62; 55; 47. The last line is nearly correct. The period between 1800 and 1820 shows 76 per cent. This is too much, but the slave trade swelled it somewhat. There is a steady decline in the ratio of increase. Between 1800 and 1820 it was 76 per cent, between 1860 and 1880 47 per cent.

Observe, once more, the rates for successive decades, beginning with 1800: 34; 38; 29; 32; 24; 27; 22; 10; 34.

Evidently the two last are out of line. They should be 21, 21.

In all these comparisons the census of 1870 is out of line, while the other census years are mutually confirmatory.

CAREFUL ESTIMATES

are confirmed by experience. To illustrate this Mr. Kennedy, Superintendent of the eighth census, 1860, estimated the colored population in 1880 at 6,591,292. The variation by actual count was only a little over 1 per cent., his estimate being a little too high. His estimates for successive years were as follows;

KENNEDY'S ESTIMATES.

| | |
|-----------|-----------|
| 1870..... | 5,407,130 |
| 1880..... | 6,591,292 |
| 1890..... | 7,909,550 |
| 1900..... | 9,491,459 |

His estimate for 1870 was doubtless closer than the actual count so imperfectly made.

As all the false estimates are based upon it, let us examine the claims to accuracy of

THE CENSES OF 1870.

Not only is it condemned by a comparison with other dates, but it is self condemned. It is not only not trustworthy, but it does not even profess to be so. It could not be sustained by official sanction, indeed, but it lacks that also.

General Walker, the Superintendent, a most able and accomplished man, certifies, not to its accuracy, but its inaccuracy, and especially in the enumeration of the negroes. He urged, in advance of the census, the imperative need of improved methods. The then existing method he characterized as "cumbersome, antiquated and barbarous." (See Abstract 9th census, pages 2-4).

The needed improvements were not made, and he was compelled to accompany the census with the statement, that "nearly every important table is prefaced by a body of remarks, in which are set forth the *errors* known or suspected." These errors were greatly aggravated in the Southern States.

General Walker's complaints of the old law were not capricious. The United States Marshals, selected for entirely different objects, were next in rank to himself, but not amenable to him, nor selected by him. In the Southern States they were selected with sole reference to party considerations. It had been strange if these outside duties had not been neglected. In a word, the machinery was not calculated to work out accurate results. The errors were of defect. The officials did not trouble themselves to seek and find the lost sheep in the wilderness. The negroes were suspicious, they feared they might be enrolled for slavery, or for taxation.

The return, which, according to anticipation, should have shown an increase of about 965,000 colored people, showed less than 440,000 of the expected increase, more was missing than found—440,000 found, 520,000 missing.

In the preface to the 10th census, General Walker again recurs to the unreliableness of the 9th, culminating in South Carolina in such *extraordinary results* as to lead to a new count. There "the gain of population (between 1870 and 1880) was an *impossible* one, transcending the known capabilities of human procreation."

This grossly inaccurate census is

THE SOLE WITNESS

for the erroneous estimates; for, evidently, the subject-matter is by far too large for individual observation. But even on this bad basis

THE CALCULATIONS

themselves are in some cases widely erroneous. An article in the *North American Review* of July, 1884, by Prof. Chas. A. Gardiner, abounds in errors of calculation. It represents the seven Atlantic and Gulf States (before named) with a population of 3,721,481 as a "compact territory, uniform in climate and resources, inhabited by two-thirds of all the negroes in the United States." Now the colored population of the Union being 6,518,372; two-thirds of that number is 4,345,580. The States named lack 624,000 of the requisite number to make two-thirds of the whole colored population.

Again, the same loose writer says that the negro population had increased 35 per cent in 10 years, and then adds, "negroes increasing $3\frac{1}{2}$ per cent annually, will double in every 20 years." Now, an increase of 35 per cent in 10 years is not an increase of $3\frac{1}{2}$ per cent annually. The difference is the same as that between simple and compound interest. An increase of 35 per cent in 10 years is the result of an annual increase of less than 3.1, which would yield in 10 years 35.7 increase. An increase of 35 per cent in a decade, would make 100 become 182 $\frac{1}{4}$ instead of 200 in 20 years. To double in 20 years, the increase in 10 years must be 42.9—a greater rate than obtains in the United States as a whole, or in any considerable section.

The mistaken census of 1870 is surely bad enough, without the aid of loose calculations.

WILD FIGURES.

The prophets of evil estimate the colored population as doubling every 20 years after 1880, until 1980. Why not pursue the estimates a little further? Give the calculators *rope*, and look two centuries ahead, instead of one. It is a short period in the life of a nation. At their incredible rates

PURSUE THE CALCULATION

and see what these eight States would then support. In the year 2100 A. D., we should have in the eight States a population of over

eight billions of colored people. In Georgia alone, her teeming millions of blacks, would exceed the present population of the wide, wide world!

SOME FIGURES.

They estimate the increase for 20 years after 1880 at 100 per cent. What was it for the 20 years preceding 1880? Can you believe it? Not 100 per cent. No, nor 50 per cent. In the 20 years of our *last* experience it was not so much as half the increase in which they indulge for the next 20, and run on with it a hundred years ahead. The rate for 20 years, from 1860 to 1880 was $46\frac{3}{4}$ per cent, lacking $3\frac{1}{4}$ of being half the rate assumed for future periods of twenty years each.

But perhaps the rate for successive periods increases. Just the reverse. It shows a steady decline. For 20 years from 1800, it was 76.8; from 1820, 62.3; from 1840, 54.6; from 1860, 46.75.

The early conditions were exceptionally favorable. While the slave trade continued, there was *enforced immigration*, and the negroes introduced, moreover, were nearly all adults, of the prolific age of life. There were few old people or children imported.

NARROW BASIS OF INDUCTION.

To take *ten* census reports out of the *ten* at our command, is very unphilosophical. It is mere charlatanism. If we reject eight and accept two only, observe the result.

In 1870 the estimates would have been the exact reverse of those of 1880. The increase in 1870 was less than ten per cent. The colored population in 1970 would have been estimated at about 12,500,000 instead of nearly 200,000,000. Indeed, a plausible case could have been made for Victor Hugo's prophecy of the rapid extinction of the colored race. Consider the argument: Not until 1865 were the old conditions changed. In these four or five years, at the old rate of increase, the negroes ought to have gained about ten per cent. For the remaining years of the decade there would then have been *no increase*.

FORE AND HIND SIGHT.

Comparing the line of sight to a rifle, the census of 1870 being too low, was a false sight. Compared with 1860, our foresight

was too low and we shot below the mark. Compared with 1880 our hindsight was too low and we shot entirely too high.

We need the light of all the census reports, of a long experience, to rectify temporary errors and accidents.

NEW CONDITIONS.

In all our estimates we must remember how constantly new conditions arise in human affairs. To look one hundred years ahead is looking beyond our ken. We are not prophets, even with ten census reports as a basis, much less with two.

With increasing density of population, for example, new conditions occur. The Northwest and the Southwest will gradually fill up and the South will become

THE EMIGRATION GROUND

of the world; for the North, East, West, and for Europe. The immigration of whites to the South will tend to check the increase of the colored race, and indeed tend to their *diffusion* through the Union, as domestic servants, hotel waiters, agricultural and general laborers, etc. Whenever population begins to

PRESS ON SUBSISTENCE

the survival of the fittest will begin to tell on the weaker race.

How new conditions tell on population is seen in the effect of the war. The blacks were but slightly affected. Mr. Kennedy's figures as to them were verified substantially in 1880, and were nearer the truth in 1870 than the census itself. But how as to the whites? The war played havoc with his estimates, based, as they were, on continued peace, *i. e.*, parity of conditions. The estimate in 1860 of the aggregate population in 1880 was 56,450,241. It really was 50,155,783, a falling off of 6,294,458, and this notwithstanding a great increase of immigration.

As the South advances from agricultural to manufacturing pursuits, the same conditions will occur which drove the negroes gradually from the Northern States. They are unfit for the higher processes of industry. The difficulty of making a living will check increase.

England's growth has been the result of growth in skill, and of

large differentiation in pursuits. Can the negro, in these regards, spell up to the whites? Hardly. And if not, the disposition to increase and multiply must yield to hard necessity.

It is interesting to note the relative increase of the negro race in the United States and in the British West Indies. Some valuable figures and comments are to be found in the volume published by the State Board of Agriculture of South Carolina entitled "South Carolina," and prepared, in large part, by Major Harry Hammond.

The importations of negroes into the United States, quoted from Mr. Carey, are as follows:

| | |
|----------------------|---------|
| Prior to 1714..... | 30,000 |
| 1715 to 1750..... | 90,000 |
| 1751 to 1760..... | 35,000 |
| 1761 to 1776..... | 74,500 |
| 1777 to 1790..... | 34,000 |
| 1791 to 1808..... | 90,000 |
| Number imported..... | 353,500 |

By the census of 1790 the number then in the country was 757,208, showing a very large natural increase. The number emancipated in 1865 was probably nearly 4,900,000 (accurately estimated). Put it at 4,600,000, and this shows over thirteen emancipated to one brought into the country.

A CONTRAST.

The number imported into the British West Indies is estimated at 2,000,000; the number emancipated at 660,000, *i.e.*, three were imported to one emancipated. The contrast in favor of the United States is therefore about forty to one.

Valuable statistical information is given by J. Shahl Paterson in the *Popular Science Monthly* of September, 1881 (continued in October). His estimates are affected in important particulars by his failure to appreciate the errors of the census of 1870; allowing, however, for this element of error, his treatment of the census is suggestive. He furnishes particulars in regard to white immigrants as follows, for successive decades beginning with 1790—1800.

| Decade
ending. | White
immigrants. |
|--------------------|----------------------|
| 1. 1800..... | 43,000 |
| 2. 1810..... | 60,000 |
| 3. 1820..... | 98,000 |
| 4. 1830..... | 150,000 |
| 5. 1840..... | 600,000 |
| 6. 1850..... | 1,700,000 |
| 7. 1860..... | 2,500,000 |
| 8. 1870..... | 2,400,000 |
| 9. 1880..... | 2,800,000 |
| Total to 1880..... | 10,351,000 |

The great tide set this way about 1840.

The handling Mr. Paterson gives the statistics of emigration is worthy of careful study. His conclusions as to the whites are that the native whites of the North increase at the rate of 15.7 per cent., and at the South 30.4 per cent. in a decade. We can scarcely agree with a conclusion which makes the disparity so wide. The estimate of colored increase is based on the census of 1870, allowing 1.5 per cent for error, at 33.3 per cent. The error, we think, was probably not far from 11 per cent. instead of 1.5.

Upon his own basis he estimates the native whites of the North one hundred years hence, 1980, (their present number being 24,403,000) at 105,000,000, while the colored population will have increased from 6,577,000 to 117,000,000.

His estimates on the movement of the colored population are more satisfactory. But new and now unknown conditions are likely to affect the problem, and upset all our calculations based on the past, and supposing the future to be more constant than it will probably be.

INCREASE OF THE WHITES.

The relative increase of the whites at the South is somewhat more difficult to estimate than that of the blacks, because more affected by emigration and immigration. In the census of 1870 the whites were probably better counted than the blacks. By it the increase of the whites in the decade ending in 1880 was 28 per cent., while that of the colored people was 33. The whites lost by excess of

emigration over immigration, however, much more than the blacks. The blacks lost little by the war, chiefly infants and old people, for a short period after freedom. The *prolific* age (corresponding with the military age) was little affected, while the losses of the whites were from this very age, telling, for a time, heavily on ratio of increase.

ANOTHER TEST.

In 1870 there were living in the United States, including Georgia, 719,124 whites born in Georgia. In 1880, 933,061, an increase of 30 per cent. The enumeration of the whites was more nearly correct than that of the blacks. A like comparison of the blacks shows 589,929 in 1870, and 786,306 in 1880, an increase of 33 $\frac{1}{2}$ per cent. Allowing for errors in 1870, their per cent of increase would be reduced *below* that of the whites.

The South—the whole country—is deeply interested in this question, whether the country is to be Africanized. No State has a deeper interest in it than Georgia, the centre of colored population. But there is no such black outlook. The wild use of statistics raised the apprehensions, the serious and sober use dispels them. We may safely dismiss these vain fears as unwarranted by the facts.

COMPARISON OF 1870 AND 1880.

The census of 1870 was unreliable, and its errors aggravated at the South by peculiar conditions. The worst errors related to the black population, and these were concentrated on the Southern tier of States, especially on South Carolina, Mississippi and Louisiana. Georgia herself was then (in June, 1870,) under military rule.

The census of 1880, on the contrary, was the best ever taken—with improved machinery and with the utmost care. This very fact exaggerated the contrast between it and the 9th census.

Instead of a gloomy view, we think the future full of hope and promise. This fine country was not conquered from the red man for the black; it will never cease to be a white man's country, unless all history is false, and the superior race shall yield to the inferior. Other principles will come into play when any such result is seriously threatened.

There was in slavery, whatever its faults, nothing to retard, but everything to stimulate, the increase of the colored people. As it was with King Lear, "the king lacks soldiers," even so with the master—he wanted slaves. There were no such things as improvident marriages, for there was no difficulty about bringing up children. There are more drones in the colored hive now than then.

All this is said in perfect kindness towards the colored race. Such a rate of increase were as bad for them as for the whites. Civilization would perish in their hands.

As regards Georgia in particular, we would as soon risk her to take care of herself, as any other State or people. She has before her a future of growth and development, of largely diversified industry, increased agricultural diversity, united with immense increase in manufacturing, mining and all other forms of industry. Coal, iron, lumber, water power, cotton, rice, sugar, climate, soil, health, all these she has, and a beautiful country, for a superior race. The tide will turn this way, probably, in a peculiar and desirable way, not so much by direct immigration from abroad but rather from the North, overflowing this way, a population already assimilated, and in the second generation indistinguishable from our own.

CHAPTER III.

INSTITUTIONS OF THE PEOPLE.

CONSTITUTION, GOVERNMENT AND LAWS.

State Government—Constitution of 1877.—The limitations upon the powers of government in this Constitution are unusually complete and pronounced, embracing nearly all the provisions for the protection of liberty and personal rights to be found in any State Constitution, and some additional safeguards, which have been copied in other States.

Prominent among them are the provisions limiting taxation, limiting State credit and City and County credit (the most dangerous powers of government), regulating railroads by law, requiring a majority of *all the members* of each house, instead of a majority of a mere *quorum*, to pass bills, requiring a two-thirds vote in sundry important cases, and the like.

Some defects in the Constitution and suggestions as to the remedy have been recently discussed in an able series of articles by a prominent citizen, with a view to remedying the defects without hazarding the valuable features of the Constitution, or incurring the expense of a Convention. The suggestions were the following viz.:

To strike from the Constitution the provision as to the introduction of, and action upon, local and special bills.

To fix the limit of the biennial session at eighty days, and at the same time to reduce the time to be devoted to local legislation.

To restore to the Governor, subject to the approval of the Senate, the appointment of Judges of the Superior Courts and Solicitors.

To extend the terms of the Governor and heads of departments to four years, with a disqualification on the part of the Governor for re-election to the next term.

To increase the number of Senators to eighty-eight, and

To restore the provisions of the Constitution of 1868 as to the selection of jurors for the trial of civil and criminal cases.

The writer of these suggestions was a member of the Convention, and for years since a member of the General Assembly, with opportunities of observing the practical operations of the Constitution.

His views will doubtless receive the careful consideration of the Legislature.

Synopsis of the Constitution—First Principles.—The Constitution opens with a declaration of first principles. Government is for the good of the people, and its officers are their servants. The object of government is the establishment of freedom, limited by justice; to this end, the protection of person and property should be impartial and complete.

Source of Power.—The people are the source of power, and all rights not delegated are reserved. *Suffrage* is bestowed on all male citizens 21 years of age, of sound mind, not criminals, and who have paid all taxes for the support of government. The number of females exceeds that of males; and the number of minors exceeds that of adults; the elective body constitutes, therefore, rather more than one-fifth of the entire body of citizens.

On election days the sale of liquor within two miles of the polls, is prohibited.

Delegation of Power—Extraordinary.—A Constitutional Convention is the supreme representative seat of power. Such a Convention may be called by a vote of two-thirds of *all the members elected* of each house. *Amendments to the Constitution* may be made by such a Convention, representing the sovereign power of the State, or they may be proposed by two-thirds of *all the members elected*, of each house, and submitted to the people for ratification or rejection.

Ordinary Powers—the State Government.—The usual distinction is made into three departments—Legislative, Judicial and Executive.

Bill of Rights—The declaration of rights limiting all departments of government, and protecting the citizen against them all, precedes the bestowment of delegated power on any department. The Bill of Rights provides for liberty of person, prohibits slavery, declares that the writ of *habeas corpus* shall NEVER be suspended, provides for liberty of speech, complete liberty of conscience, equality before the law, the proper publication of law, which shall not be ex post facto nor retroactive; provides that the social status of the people shall not be a subject of legislation, and makes numerous and powerful provisions for the protection of property.

The taxing power is closely hedged in, and limited; certain home-
stead privileges, and the property of wives, are secured.

These provisions protect the citizen chiefly from the abuse of
power by the legislative department.

Protection from the Judiciary, and by the Judiciary.—Every
person is entitled to due process of law, to a day in court, to trial by
jury, he is entitled to a speedy trial, and exposed to but one. Pro-
vision is made against banishment, against whipping, against exces-
sive bail or fines, or cruel and unusual punishments, and against im-
prisonment for debt; penalties are limited; so also punishment for
contempt of court.

The Judiciary shall declare unconstitutional laws void.

Additional safeguards appear, positively and negatively, in the
provisions bestowing and limiting the powers of the three depart-
ments of government.

ORGANIZATION INTO DEPARTMENTS.

Legislative Department.—This consists of a General Assembly,
composed of two houses, the Senate and the House of Representa-
tives. The Senate consists of 44 members, and the House of 175.

Senate—Separate Functions.—The trial of impeachment, and the
ratification or rejection of certain nominations by the Governor are
special functions of the Senate.

House—Separate Functions.—The House has the initiative of
all appropriation bills: also, of certain special and local bills, and of
impeachments.

THE GENERAL ASSEMBLY.

Elections and Sessions.—Elections for both houses are biennial,
and the term for both is the same, two years. Sessions are biennial,
and for 40 days, unless extended by a two-thirds vote of all the
members of both houses. A call session by the Governor is limited
to the matter of the call.

Proceedings in the General Assembly.—Among the special pro-
visions are some (perhaps over-stringent ones) as to local bills.

Bills to borrow money must have exact specifications.

The yeas and nays are provided for in numerous cases, and always on a call of one-fifth of the members, on appropriation bills, and on bills requiring a two-thirds vote.

A two-thirds vote is needed, to prolong a session over 40 days ; to over-ride a veto ; to raise salaries ; to re-introduce a bill once rejected ; to introduce local bills not reported ; to expel a member ; to propose a Constitutional Convention or amendment.

Both houses must keep journals and publish them.

Duties not Legislative—Elections on joint ballot of the Justices of the Supreme Court, Judges of the Superior Court, and Solicitors-General ; counting votes for Governor, and if no majority, electing Governor.

LEGISLATIVE POWERS.

General Grant of Power—All powers are granted, not repugnant to the Constitution of the United States, and of Georgia.

Restraints and Limitations—Almost the entire bill of rights is in restraint of Legislative power. The provisions that laws shall be of general operation, and that all citizens shall be equal before the law, prevent special privileges.

The power of taxation is declared inalienable ; so the State cannot depart with the right of Eminent Domain, or with the Police power.

No irrevocable grant of any privilege shall be made. Revocation of grants already made shall be on just terms to the grantees.

The granting of certain corporate powers is taken from the Legislature, and conferred on the Courts.

The Legislature cannot grant any gratuity or donation (except to the University of Georgia and the Colored University), nor extra pay, nor relief on recognizances.

Lotteries are prohibited.

Lobbying is made a crime.

TAXATION.

This subject is much labored. The power is declared inalienable.

The objects are strictly limited, to the support of Government and the public Institutions, interest on public debt, principal of the

public debt, cases of insurrection, invasion or war, and two special objects—elementary education and furnishing soldiers artificial limbs.

As to *mode*, taxation shall be uniform on classes, and *ad valorem* on property.

A poll tax of one dollar is allowed for educational purposes.

Exemptions are limited.

Public property, churches and cemeteries, charities, colleges and schools, public libraries, literary associations, books and apparatus, paintings and statuary, not for sale or profit, are exempt. No other exemptions are allowed, especially no corporate exemptions.

Uses of Public Money—These are limited to the objects stated. A sinking fund of \$100,000 is provided for, to pay bonds, etc. Officers are to make no profit out of funds. No gratuity, donation, or extra pay is allowed.

The State Credit is carefully guarded. No debt is to be contracted, save for a deficiency not exceeding \$200,000 in case of invasion, insurrection, or war, or for the payment of the public debt. The act must specify purpose and be so limited. No assumption of debt is allowed, save of war debt. No loan for any purpose. The State shall not become a stockholder. Certain *Bonds* are enumerated as void.

Local Taxation and Credit are also carefully guarded. Counties and Cities may not become stockholders and may not give nor lend, save to charities and schools. County taxes are limited to debt now existing, public works, prisons, court expenses, quarantine, paupers and education in English. The debt of city or county shall not exceed 7 per cent. of assessed value of property. If not now seven, it may be increased three per cent. For deficiency one-fifth of one per cent. is allowed. A two-thirds vote is required. Adequate provision for debt must be made in advance, to meet it in not exceeding thirty years.

Powers as to Railroads.—These are full and yet carefully guarded. The Legislature must regulate rates and secure impartiality. Any amendment of a charter shall operate as a novation, and subject the railroads to legal regulation. Buying its own shares,

monopoly, rebates, deception as to rates, are prohibited to every railroad.

Certain Powers as to Insurance Companies are granted. For taxation, licenses, requiring deposits, etc.; also requiring reports.

Powers as to the State Militia and Volunteers are granted.

Powers Concerning Education—These concern elementary education; also the higher education in the University of Georgia. A State School Commission and a school fund are provided. Only the elementary branches are to be taught. White and colored schools are to be separate. County and city taxes may supplement the State school fund on certain conditions.

DELEGATION OF POWER.

To Counties.—No new counties are to be laid off. A County site can only be changed by a two-thirds vote of the people. Dissolution or merger of counties require a two-thirds vote of the people. County officers and commissioners are provided for. A Tax for educational purposes is allowed on recommendation of grand juries and a two-thirds vote of the people.

To Corporations—The General Assembly grants acts of incorporation to certain more important Associations. The courts to others specified.

JUDICIAL DEPARTMENT.

This consists of the Supreme Court, the Superior Courts, Court of Ordinary, Justices of the Peace, and Notaries Public. The Legislature may establish other courts, and may abolish any except the above named.

The Supreme Court is a court of errors only. It consists of a Chief Justice and two Associates, elected by the Legislature for six years—salary, \$3,000.

Superior Courts.—There are twenty-one judicial circuits in the State, and twenty-one Judges of the Superior Court, chosen each for six years—salary, \$2,000. They can exchange at convenience with each other, or with city court judges. The jurisdiction of the Superior Court is exclusive in equity, in land titles, divorce cases and in criminal cases, involving life or the penitentiary. Provisions are made for the trial of appeals, certioraris from lower courts, etc.

Juries must be composed of intelligent and upright men.

Such are the provisions affecting the judicial department.

EXECUTIVE DEPARTMENT.

The Governor's powers and pay are small; his duties and responsibilities large and numerous. He is elected for two years, may serve two terms, and is ineligible then, for four years. In case of disability, the President of the Senate or next, the Speaker of the House, becomes acting Governor till an election supplies the vacancy.

The Governor is commander-in-chief of the army and militia, and it is his duty to execute the laws. The pardoning power is his; he fills vacancies in certain offices. In his relations to the General Assembly, he gives information, and makes recommendations; can convoke the Assembly; in certain contingencies declare it adjourned; he has the veto power, subject to two-third vote thereafter; he is charged with quarterly examinations of the books of the Comptroller-General and the Treasurer.

The Secretary of State, Comptroller-General and Treasurer are all elected by the people for two years.

The Governor appoints the School Commissioner, Commissioner of Agriculture and Railroad Commissioners.

Such is a general view of the organic law of the State. We give next a view of the more important

LAWS OF GEORGIA.

Sources of Knowledge.—These are ample and complete in Georgia, as they should be in every State; for since ignorance of the law is no excuse, the law should therefore be well promulgated.

Inherited Law.—At the separation from the mother country, there were English and Colonial laws of force in the colony. These formed a sort of stock on which subsequent laws were grafted: With some limits as to their application, they were all declared of force by the act of 1784, known as the "Adopting Act," viz: The Common Law of England; the Civil and Common Law; the principles of Equity; English Statutes, and a body of Provincial Acts as they were in force May 14th, 1776.

The English statutes were collated by authority in Schley's Digest, 1-26.

State Laws.—The first digest of State laws was Watkins' Digest, rejected by the General Assembly because it contained the obnoxious Yazoo act.

List of Digests Sanctioned by Authority.

| | | |
|-----------|---------------------------------|------------|
| Volume 1. | Marbury & Crawford..... | 1802. |
| " | 2. Clayton..... | 1810. |
| " | 3. Lamar..... | 1819. |
| " | 4. Dawson..... | 1829. |
| " | 5. Prince..... | 1821—1837. |
| " | 6. Hotchkiss..... | 1845. |
| " | 7. Cobb..... | 1851. |
| " | 8. The Code, first edition..... | 1863. |

Then three subsequent editions of the Code, in 1867, 1873, and 1882. After every session the laws are published in pamphlet form.

The Code is a monument to the genius and industry of its compilers, especially to those of the lamented Thomas R. R. Cobb, the moving spirit in its conception and execution. The index is defective, however, in principle and execution.

The Law as it now is—Code of 1882.—The Code is abundantly and laboriously annotated; numerous notes show the heads of especial practical importance, and mark disputed tracts of law. By glancing over its pages, one may see, not the blood, but the ink-spots of many legal frays.

The Code consists of four parts:

Part 1. Organization. 2. Civil Code. 3. Code of Practice. 4. Penal Laws.

The Rank of Laws appears in the Constitution, and also in the Code.

1. The Constitution of the United States.
2. Laws and treaties under the same.
3. The Constitution of Georgia.
4. Public laws under the same.
5. The unanimous decisions of the Supreme Court made by a full bench.
6. Private laws.
7. Customs, of universal practice.

As authority, legal maxims, text books and practice.

Decisions of the United States courts are paramount on constitutional questions, equal on commercial law, superior on State law.

We give a brief view of the several parts of the Code.

PART I.—ORGANIZATION.

This part sets forth the boundary and jurisdiction of the State, and its political divisions. There are 137 counties, 44 senatorial districts, 21 judicial circuits and 10 Congressional districts. These will be given in more detail hereafter.

Citizenship is defined, and the distinction of race. One-eighth of African blood constitutes a person of color.

The Code gives a fuller view of the three Departments of State than does the Constitution. So also of County organization and City, of the public revenue, debt, property, defense, etc., of elections, police and sanitary regulations, and the like.

This part of the Code prescribes the mode of conducting *Elections* by the People and by the General Assembly.

It defines the duties of the Executive Department, of the Governor, his residence, official minutes, etc., of the State House officers, the Secretary of State, Treasurer and Comptroller General, School Commissioner, Commissioner of Agriculture, Attorney-General, Librarian, etc.

More particular reference will be made hereafter to the Department of Agriculture, established first in Georgia and copied extensively elsewhere.

The same part of the Code defines more fully the duties also of the Legislative and Judicial Departments; the organization of the State into counties and other political divisions; provides for Taxation, the Public Revenue, Debt and Property, Public printing and Public defense.

The Public School system and the whole Educational system of the State is also here set forth, and the provision for the Blind, Deaf and Dumb, Lunatics, and unfortunate classes, also Police and Sanitary regulations, and the Penitentiary system.

To some of these fuller reference will be made hereafter.

Educational.—The school law of Georgia is a model unsurpassed in the Union for completeness and good features. It is a splendid

blank, however, which needs to be filled with *money*. Provision is made by the Constitution for donations to the University of Georgia, but the Legislature seldom avails itself of them. The whole educational system is a form to be filled out—scantly supplied by the State. The endowment of the University is the liberality of a past generation.

PART II.—THE CIVIL CODE.

This, the most important part, sets forth the rights, duties and liabilities of citizens, with their limitations.

Rights of Citizens.—In general, a citizen has a right to the free use of his own person and property, except as restrained by law. He has thus the right to personal liberty and personal security, viz.: of body, limb and reputation, freedom of conscience and religious liberty. He has the right to the protection of law, to make contracts, to appeal to the courts and to testify in them. Adult male citizens have the right to the elective franchise, to hold office and to perform civil functions.

All persons, whether citizens or not, have the right to the protection of the law, to hold property, to the free use and disposition of the same during life, and the qualified right to dispose of it at death.

Indeed, the whole Bill of Rights, in the Constitutions of the United States and the State, is in the interest of personal rights and equality before the law.

RIGHTS AND DUTIES ARISING OUT OF SPECIAL RELATIONS.

DOMESTIC RELATIONS.

Husband and Wife—Parties.—The marriage of white persons to persons of color is prohibited. Marriage is prohibited to male persons under seventeen years, females under fourteen. For a female under eighteen the consent of her parents or guardian is necessary. Persons related by blood more nearly than first cousins may not intermarry. The marriage of a deceased wife's sister is not prohibited. A license from the ordinary is required.

The Grounds of Divorce are consanguinity, too close affinity, mental or physical impediments, force or fraud in obtaining marriage, pregnancy at time of marriage, adultery, desertion for three

years, conviction for a base crime, with sentence to imprisonment for two years. Cruel treatment and habitual intoxications furnish discretionary grounds.

The concurrent verdict of two juries is necessary to a total divorce. The juries fix the relations of the parties to the children and property.

Property of Married Women.—This remains separate, whether held at marriage or acquired thereafter. The wife has a limited agency by reason of her relation as such. She has a right to dower, unless surrendered, in real estate in possession at the death of the husband.

Numerous other provisions affect this most important relation.

On the death of the husband intestate, the wife inherits from him, if no child, the whole estate; if child or children, not exceeding four, a child's part; if over four, one-fifth of estate.

Parent and child are bound to mutual support when needed, and have the right of mutual protection. It is the parent's duty to maintain, protect and educate the child.

Provisions are made for adoption of children, for protection against cruel treatment by parents, etc., etc.

Guardian and Ward.—Ample provision is made for this relation, needing no special mention.

Master and Servant.—Provision for this relation by indenture, etc., is made. *Laborers in factories* are not subject to corporal punishment. The hours of labor for minors cannot exceed those between sunrise and sunset, and time for meals must be allowed.

RELATIONS, OTHER THAN DOMESTIC, ARISING OUT OF CONTRACT.

Principal and Agent—Few peculiar provisions are to be found except in the law affecting

Overseers—As this agency is very broad and general, much of it is left to implication, and so it has been much contested. The contract need not to be in writing, though not to be performed within a year.

Landlord and Tenant.—This is another frequent relation. The landlord has a lien for rent and may distrain for it. Rent bears interest. Rent, not exceeding half the crop, payable in kind, is not

liable to process against tenant. The landlord may have a special lien for provisions, and this must be written.

Deposits.—A bank officer is liable, criminally, for receiving deposits when he knows the bank to be insolvent.

Interest.—The legal rate is 7 per cent. By written contract it may be eight. For usury the excess only is forfeited.

Debtor and Creditor.—The rights of creditors are favored. Certain contracts must be in writing, viz., securityship; the sale of land; promises to revive a debt out of date; contracts not to be performed within a year (except with overseers;) and some others.

The rights of securities are very strictly construed.

Conveyances to defeat creditors are void.

A debtor can prefer a creditor.

Homestead.—The value set apart amounts to \$1600.

Exemptions.—These are—of land, 50 acres and 5 acres added for each child under 16; a farm-horse or mule, cow and calf, 10 hogs \$50 worth of provisions, five added for each child, and some other items, including tools of trade.

A deceased debtor's property is liable to certain charges before debts are paid; viz., a year's support for the family, etc.

Limitation of Actions.—Notes are barred in six years, open accounts in four years, unless by reason of disability in plaintiff.

A new promise must be in writing. A payment entered by the debtor suffices.

Mortgages—must be recorded within 30 days, else they only protect from the date of record.

Liens.—Numerous liens are provided for by the code, express and implied. Among them liens of attorneys, bailees, carriers, factors, inn-keepers, laborers, landlords and mechanics.

The vendor's lien is abolished.

PROPERTY RIGHTS.

Real Estate.—The tenure is allodial, the land held under the State without service of any kind, and limited only by the right of eminent domain in the State. Transfers must usually be in writing and recorded.

Prescriptive Rights.—Possession for twenty years gives title; so

seven years adverse possession, except against persons laboring under disability of infancy, etc.

Personal Property.—Stocks are usually personalty.

Adverse possession for four years gives prescriptive title, except in cases of disability of true owner.

TRANSFER OF PROPERTY.

By Sale.—The price must be agreed on, the goods identified and delivered, actually or constructively. A consideration is necessary. A deed to personal property needs no witnesses. There is in Georgia no "market overt."

By Gift.—The donor must intend to give, the donee to accept and there must be a delivery, actual or constructive. Acceptance is usually presumed.

Delivery by a parent to a child living apart from him creates a presumption of a gift.

Gifts against creditors are void.

By Will.—Generally, any person can make a will, except minors under 14 years of age and imbeciles; married women only in special cases.

The power is unlimited, except to defeat creditors and dower.

A will for charitable uses must be made 90 days before death, and (if wife or child living) not exceed one-third of estate.

Limitations may extend to a life or lives in being and 21 years (and the period of gestation thereafter) and no longer.

Fraud vitiates a will; so also a mistake as to the existence or conduct of heirs at law, vitiates as to such heirs.

Except to nuncupative wills, three witnesses are necessary.

Descent.—The law of inheritance is as follows:

The husband is usually sole heir of intestate wife (one special exception, (§2484.))

The wife is sole heir, if no children or descendants of children.

If husband leaves wife and child, or children, the wife takes a child's part, unless the shares exceed five, when the wife shall take a fifth.

Children, if no wife, inherit whole estate. Lineal descendants represent deceased child, per Stirpe. Posthumous children are included.

Brothers and sisters stand in the next degree, the paternal half-blood included. If no brother or sister of whole or paternal half-blood, then maternal half-blood inherits. Deceased brothers or sisters are represented by their children or grandchildren per *stirpe*.

The father, if living, and in certain cases, the mother, if she is living and the father not, inherits as would a brother and sister.

Beyond these degrees, paternal and maternal next of kin are equal.

First consins stand next, and equally with them, uncles and aunts.

More remote degrees are determined by the Canon law as in the English decisions prior to July 4, 1776.

LIMITATIONS ON RIGHTS OF PERSON.

A person has, in general, all rights of person not prohibited. The right to body, limb, freedom of locomotion, nay, even the right to life itself, may be forfeited for crime, punished by imprisonment at hard labor, or by death. Branding and flogging in the penitentiary also limit personal rights. Special limitations also prevail in the army and navy. The citizen is also liable to military, road and jury duty, and to serve as a witness. His general right to bear arms is secured to him, subject to the provision that they be not concealed. Personal liberty may be limited not only by crime, but by insanity, and by imprisonment for the fraudulent concealment of property. The writ of habeas corpus in Georgia is *never* suspended. The elective franchise may be forfeited for crime and by non-payment of taxes. The right to hold office may be forfeited for crime—including duelling—or by default in regard to public money. Personal rights are subject to quarantine, vaccination, and to vagrancy laws. Sunday work or contracts are prohibited. The office of Professor in the University of Georgia was at one time limited to persons of the Christian religion; this restriction has been repealed as unconstitutional.

LIMITATIONS ON RIGHTS OF PROPERTY AND ITS USE.

The right of eminent domain in the State, limits that of the property holder. But just compensation must be made by the State for property taken. The State has the right of collecting taxes, and of impressment. The State regulates common carriers, inn-

keepers, and licensed trades and professions; also, railroads and other corporations founded on the exercise of State sovereignty. There are inspection laws—laws regulating liquor selling and tippling houses on the Sabbath day—insolvent laws—laws regulating game and fish, escheat laws, stock laws and fence laws (now left to local option). The State requires the support of one's family, requires alimony in cases of divorce, and prevents entails. Self-made limitations on property rights, by contract, are enforced by the State. In certain cases specific performance is enforced; in others, damages are awarded. The right to will property is limited by the wife's right of dower; by the rights of creditors, and by those of the family to twelve months' support. Subject to such limitations, the right of property is absolute, one can do with it whatever is not prohibited.

RIGHT OF CONTRACT—HOW LIMITED.

Contracts on Sunday and keeping open tippling houses on Sunday are prohibited. The marriage contract is limited by certain degrees of consanguinity or affinity. White persons and colored may not intermarry. Factory operatives under age are limited to work between sunrise and sunset, with a proper interval for meals. Compounding felonies, lotteries, and gambling are prohibited. These are the chief restraints upon contract.

PART III OF CODE—PRACTICE.

Remedies differ in different States more than do *rights*. *Procedure* in Georgia has ever been easy and intelligible. The judiciary act of 1799 made numerous and valuable improvements in law procedure. It has been said that since its passage, with some added legislation allowing amendments, no lawyer in Georgia was ever at a loss for a remedy. Among the simplifications were easy methods for the foreclosure of *mortgages*, for deciding *claims*, establishing *lost papers*, the *partition* of property, *attachments*, *garnishments*, summary proceedings in *trespass*, *possessory warrants* for personal property, etc. Common law and equity jurisdiction are merged in the same court, and are gradually merging into the same action. Juries are also allowed in equity. There is a convenient system provided of arbitration, the decision made a rule of Court.

Still other simplification was made in *pleading* in 1847, by what are known as the Jack Jones forms. The rule of pleading in Georgia has been briefly stated thus: "Plead what you please and prove what you can."

For general convenience there are twenty-one Judicial Circuits, and Superior Courts are held in each county twice a year. There are also County and Justices' Courts and certain jurisdiction is conferred on Notaries. Thus justice is brought close home, as regards place. Defendants are generally sued in their own counties. In time, justice is not so prompt, and it has been complained that the collection of debts and the trial of criminals in Georgia is too slow. The evidence of parties is admitted when both parties can testify.

PART IV—PENAL LAWS.

The criminal law of Georgia was codified at an early period in 1883, before that of any other State, by Joseph Henry Lumpkin, afterwards Chief Justice of the State. The right of self-defense under proper circumstances is recognized, even to the killing of the assailant; also the right of a private person to arrest a criminal. Drunkenness is no excuse for crime, nor ignorance. Stringent provisions are made against frauds by bailees, factors, bank officers, State officers, etc. Any bailee, clerk, or other person, fraudulently converting goods entrusted to him is liable criminally. Bank officers are liable for violation of charter, and presumed to know the charter, etc. Insolvency of a bank is presumed to be fraudulent. Receiving deposits when insolvent is a crime, so is declaring fraudulent dividends. State officers may not use public money or take interest thereon. Obstructing railroad tracks is a crime. Railroad conductors are invested with police powers. Lobbying is a crime. Duelling and carrying deadly weapons concealed are crimes. Labor or hunting on the Sabbath are criminal; so is interference with religious worship and selling spirits (except in a town) during worship, within a mile of church. Cruelty to animals and to children are criminal offenses.

The general view of the Code ends here.

THE DEPARTMENT OF AGRICULTURE.

To an intelligent man of to-day it is a matter of surprise that the important interest in which three-fourths of the people are directly engaged, and on which the prosperity and happiness of all so largely depend, had not long ago demanded the establishment of a special Department to be devoted to its development and progress. The foremost planters of the State early recognized the necessity for some kind of organization, and, as we have seen, took steps to form the STATE AGRICULTURAL SOCIETY in 1846, which was recognized in a substantial manner by the Legislature of 1860, which made an annual appropriation of \$2,500 for its support. The results of the war, however, with its wide-spread desolation and the upturning of our long-established system of labor, soon caused the farmers of Georgia to take counsel for the organization of more efficient means for the promotion of the down-fallen, prostrate farming interest.

The State Agricultural Society, on its re-organized basis, the Patrons of Husbandry, and other organizations of farmers, resolved that "our thrift and well-being require that the farming and material interests should have a State Agricultural Department established." The State Agricultural Society first took action at its session in Atlanta in 1870. The State Grange followed in similar resolutions in 1873, and, at Columbus, in 1874, the former organization again affirmed its previously expressed views and wishes. Governor James M. Smith, in his annual message to the Legislature, January, 1874, took strong ground in favor of such a department. He said:

"Men now distrust analyses and experiments which are given to the world on unofficial endorsement. Could the information so much needed in the every-day operations of the field and shop be sent forth from such a Department, . . . it would carry with it a weight and sanction rendering it acceptable to the public. Here could be gathered from every source the most advanced ideas and methods affecting the great interests committed to such a department."

The result was the drafting of a bill for the purpose by Hon. John P. Fort, of Bibb, and its presentation in the House of Representatives by Hon. Edgar M. Butt, of Marion, during the session of 1874.

The bill met with decided opposition in the House, and was finally passed only by the casting vote of the Speaker, Hon. A. O. Bacon—an honor of which this distinguished gentleman may justly be proud—and was approved by Gov. Smith February 28, 1874.

The Department was organized August 26, 1874, by the appointment of Hon. Thomas P. Janes, of the county of Greene, as Commissioner. Without precedent to guide in the complete organization and equipment of this, the pioneer State Department, the Commissioner proceeded with caution and admirable judgment to select his corps of assistants, and formulate a plan of operations. In less than one year the Department had fully entered upon a career of usefulness that has been without a parallel in the history of the States. Dr. Janes was reappointed at the end of his first term of four years, and continued in office until August 29th, 1879, when he resigned. Governor Colquitt immediately filled the vacancy by appointing Judge John T. Henderson, of the county of Newton.

At the expiration of the unexpired term for which Judge Henderson was appointed, he was continued for a full term of four years by the lamented Gov. Stephens.

To give a complete exhibit of the work of the Department, and the influences for good it has shed abroad throughout Georgia and the surrounding States, would require more space than is available.

One of the first publications, of an enduring character, issued by the Department, was the "Manual of Sheep Husbandry in Georgia," a little book, it is true, but pure gold. Many thousand copies, and more than one edition, were needed to supply the demand for the book, and it only needed the protecting ægis of a stringent dog law to arouse such an interest in sheep culture, and induce such a development of this pastoral industry, as would have greatly augmented our wealth and happiness.

But, unhappily, the wisdom of the General Assembly took a different direction.

The "Hand-Book of Georgia," a work of more pretensions and great value, soon followed in compliance with a special requirement of the organic law. It was designed to illustrate the natural advantages of the State as a home for the industrious and a resting-place for the traveler in search of a better country, and well did it perform its promise.

Following in succession came the "Farmer's Scientific Manual,"

"Manual on the Hog," "Manual of Cattle," "Manual of Poultry," "Manual of Georgia," and "Georgia from the Immigrant Settler's Standpoint."

The "Manual on Cattle" and "Manual on Poultry" were published under the present administration of the Department.

The character and purpose of the publications already named are sufficiently indicated by their titles. Their object is to diffuse practical information on the subjects treated among the readers for whom they are designed. The demand for the "Stock Manuals"—as those on sheep, hogs, cattle and poultry are called—has been very heavy, and there is every evidence that they have been the means of enkindling and sustaining a desire for improvement in stock breeding that cannot otherwise be accounted for.

In addition to these issues, the Department publishes monthly, during the growing season, crop reports, showing the condition and progress of crops, stock, and other rural industries. These monthly reports are the occasion and opportunity for practical comments and timely suggestions for the Commissioner to the farmers, and afford also a valuable medium for the expression of the views of the farmers themselves. During the past year the Commissioner has incorporated a new feature—viz.: The publication, for each month, of one of Geo. Ville's inimitable lectures on practical and scientific agriculture. These lectures are translated from the French by Miss E. L. Howard, the accomplished daughter of the late lamented Charles Wallace Howard. The feature has met with decided expressions of approval and appreciation from the reading farmers of the State, and will be continued.

In regard to the results of these publications, their purpose being so well indicated by their titles, it is sufficient to say that they have not been published in vain. The farmers of Georgia are to-day better posted on the subjects treated than those of any other State not so fortunate in its means of diffusing practical knowledge.

The superintendence of the inspection and analysis of fertilizers has imposed a large amount of work on the Department, and demanded the exercise of the soundest judgment and nicest discrimination on the part of the Commissioner and his officers. The trade in fertilizers has grown from 48,000 tons, sold in Georgia in 1874-75, to more than 170,000 tons in 1884-85; the aggregate for the 11 years being little less than 1,200,000 tons, representing a total value of about

forty million dollars! Since 1877 the fee of fifty cents per ton for inspection is required to be paid into the treasury of the State, the inspectors receiving fixed salaries. The income to the Treasury from this source during the past eight years has been about \$500,000. All of this large business is under the supervision of the Commissioner of Agriculture, the actual labor of inspection and analysis being performed by a corps of six inspectors and one chemist. A large part of the office work in the Department has relation to the inspection and analysis of fertilizers.

It would be very difficult, yea, impossible, to correctly estimate the amount of money that has been saved to the people, directly and indirectly, by the admirably conceived and wisely executed inspection laws of Georgia. It is a matter of common observation by all who profess any familiarity with the business of our civil courts, that the day of spurious fertilizers in Georgia is passed and gone. Our court dockets are no longer crowded with "guano cases" as they were ten years ago. The business of manufacturing and selling fertilizers has been reduced to a solid basis, and dishonest sharks find little opportunity for plying their art in Georgia.

Under the administration of the present Commissioner, the purchase and distribution of choice farm and garden seeds has been made a prominent and quite a popular feature of the Department work. It is not easy to overestimate the importance of selecting and planting the most perfect seeds—each of its kind—with reference to quality of product, prolificness, early maturity, etc. A very small percentage of increase in quantity, or improvement in quality, when estimated on the entire production of a given crop, will be sufficient to justify the closest attention to the matter of selecting seeds. The Commissioner fully appreciates this fact, and has done much to wake up the farmers to a proper estimation of the importance of planting only the very best seeds. The result is already manifest in the improved quality and productiveness of the varieties of corn, wheat, oats and potatoes, to say nothing of crops of minor importance.

The fish interests of the State are also confided to the Commissioner of Agriculture, he being *ex-officio* Commissioner of Fisher

ies. Under his direction quite a number of carp have been distributed to the citizens of Georgia, who are now awaiting with longing anxiety for the harvest to come.

EDUCATIONAL INSTITUTIONS.

THE PUBLIC SCHOOL SYSTEM.

The Constitution of 1868 provided for "a thorough system of general education to be forever free to all children of the State."

The first public school law was approved October 13, 1870. The fact is not generally known that the main provisions of the Act were identical with a plan submitted to the Legislature by the Georgia Teachers' Association.

This body, in the month of August, 1869, held its annual meeting in the city of Atlanta. A committee was raised to report upon a school system adapted to the condition and wants of Georgia. This report was to be submitted, first to the Executive Committee of the Association, and, after revision by that body, to the Association itself at a special session to be held in November following at Macon.

Some changes were made in the committee after its first appointment, and it finally stood as follows: Gustavus J. Orr, now State School Commissioner, chairman; the late Bernard Mallon, for a long time Superintendent of the schools of Atlanta; the late John M. Bonnell, then President of the Wesleyan Female College; Martin V. Calvin, now a representative in the Legislature from Richmond county, and David W. Lewis, now President of the North Georgia Agricultural College at Dahlonega.

A meeting of the committee was held, and each member having fully given his views, Dr. Orr was directed to write the report. When he had performed this duty, his work was submitted to the Executive Committee, consisting of Dr. H. H. Tucker, Prof. LeRoy Broun, the late Dr. Alexander Means, Prof. W. D. Williams, the late Dr. J. M. Bonnell, the late Mr. Mallon, and Dr. Orr himself, the last three being members of both committees. The report was read, and nine hours were spent in discussing it, section by section. The result of this careful examination was the adoption of the report by the Executive Committee as it was written.

Another full discussion was had before the State Teachers' Association, that body spending an entire day upon this one subject. A

few slight alterations were made and the report was unanimously adopted. The Association appointed a committee to lay it before the Legislature, and to urge upon that body the adoption of its provisions in the form of a school law for the State.

Before the assembling of the Legislature, reconstruction was reconstructed, and many members were unseated and others substituted by military orders in their stead.

Under the circumstances, the committee last raised thought it best not to be personally present when the Legislature convened, all concurring in this opinion.

As the session advanced, however, Dr. Orr decided to see what could be done through two personal friends, good and true men, the Hon. I. E. Shumate, Representative from the county of Whitfield, and the Hon. Council B. Wooten, Senator from the 11th District.

Mr. Mallon, through personal friends in the body, co-operated. The result was that a plan of the Georgia Teachers' Association was laid before the Committee on Education of the House and Senate, and a bill was framed and became a law, following in its main provisions the system mapped out in the report, so carefully prepared, so critically examined and so heartily adopted by the educators of Georgia.

The first changes made in the law were in January, 1872, these changes being brought about by a memorial from the same body as that from which the first plan emanated. The main effect of the alterations thus made was to cause the views of the Association, as embodied in their report, to be more closely followed than they had been in the first Act. Much credit for the changes made at this time is due to Hon. Henry Jackson, then a Representative from Fulton county.

Under the Act of October 13, 1870, an organization was affected. Gen. J. R. Lewis was appointed State School Commissioner by Governor Bullock, and entered upon the duties of his office. Schools were very generally put in operation, but as the Legislature had diverted the school fund to other purposes, when the schools closed there were no funds to pay a debt of about three hundred thousand dollars to school officers and teachers. This debt has been a source of great trouble, and, strange as it may seem, although there has been much legislation for the relief of these teachers and school offi-

cers, claims still continue to occasionally arise like Banquo's ghost.

When there came a change in the administration of the State, General Lewis having resigned, Governor Smith sent into the Senate, as one of his two first appointees—the other being Chief Justice Warner—the name of Gustavus J. Orr to be State School Commissioner. He was promptly confirmed by the Senate. This was in January, 1872, and he has since continued in the position to which he was then appointed. Almost his first official act was to direct school officers to make no efforts to establish public schools during the year 1872. This suspension was, necessary, owing to the confusion in the school finances and the lack of confidence on the part of the people because of the unpaid debt of 1871.

At the summer session in 1872, on the recommendation of the State School Commissioner, an Act was passed to raise money to pay this debt. A large sum was raised and expended under it, and it is now very well ascertained that under this statute and subsequent legislation on the subject all, or very nearly all, just and valid claims have long since been settled.

At the request of the distinguished Senator from the 29th District (Judge William M. Reese), a bill was prepared by the State School Commissioner to "Perfect the Public School System and to supersede existing School Laws." This bill was introduced into the Senate by Judge Reese in the summer of 1872, and was most ably championed by him. It passed both branches and still remains the general school law of the State.

One most important section of the bill was stricken out, that conferring on the counties the power of local taxation. All subsequent efforts to obtain a legislative grant of this power have been unsuccessful.

Before dismissing this matter, it is proper to add one statement. Some few years since a committee of the National Educational Association was raised for the purpose of framing an *ideal school system for a State*. This committee was composed of some of the ablest educational men of the entire Union. They had before them the school laws of all the States, including that of Georgia. The ideal system reported by them followed to a remarkable extent the *Georgia School Law*.

It would be tedious to follow with particularity all the legislation that has been had since 1872. Many minor changes have been

made, some of which were tried for a while and then repealed. Others still stand. Some of these changes have been wise and salutary. Some very determined efforts have been made, from time to time, to overturn the system by the opponents of public schools, but on every occasion able defenders have arisen and waged successful defensive warfare. The most signal triumph of its friends was when the Constitution of 1877 placed in the fundamental law the provision that there should be a "thorough system of common schools."

The public school fund is derived from the following sources: the poll tax, one-half the rental of the Western and Atlantic Railroad, a tax on shows and exhibitions, a tax upon dealers in spirituous and malt liquors, the net proceeds of the hire of convicts, the net proceeds of the fees, for the inspection of fertilizers, and certain other sources minor in their results. A direct property tax for the support of schools, though specifically authorized both by the Constitution of 1868 and that of 1877, and though often proposed, has never been levied. The school fund has been increased, gradually and slowly, gaining but little but, like the mechanical power known as the screw, never losing anything once gained. In 1873, the total school fund was \$250,000.00; in 1874, \$265,000.00. Year by year, it has increased until in 1884 it was \$464,888.92. Add to this the \$225,483.18 which constituted the school fund of the various cities and counties under local laws and you have, as the grand total of the school fund of Georgia for the year 1884, \$690,372.10.

Were the enrollment and the average attendance the same in 1884 that they were in 1873, the length of the school term, with the fund now at hand, would have been greatly increased. This is not the case. The fund and the number who come forward to participate in its benefits have increased with even pace. The early beginnings were very small. In 1871, there were enrolled in the schools, white, 42,914; colored, 6,664; total, 49,576. It was for the tuition of these that the large school debt of \$300,000.00 was contracted. No debt has been allowed to be contracted since that date. In 1872, as before stated, there were no public schools.

In the early summer of 1873, the State School Commissioner assembled at Atlanta the county commissioners of the State in convention. This meeting was of vast importance. Much enthusi-

asm was aroused, and as the school finances were on a better basis than at any time before, the commissioners returned to their respective counties resolved to at once inaugurate public schools. Right well were their resolutions carried out.

The following table will show by years the steady advance in the numbers of children attending the public schools of the State :

| YEAR. | ENROLLMENT. | | | Increase over
Preceding Year |
|-------|-------------|----------|---------|---------------------------------|
| | WHITE. | COLORED. | TOTAL. | |
| 1873 | 63,922 | 19,755 | 83,677 | 34,099* |
| 1874 | 93,167 | 42,374 | 135,541 | 51,864 |
| 1875 | 105,990 | 50,385 | 156,375 | 20,808 |
| 1876 | 121,418 | 57,987 | 179,405 | 23,011 |
| 1877 | 128,296 | 62,330 | 190,626 | 11,221 |
| 1878 | 137,217 | 72,655 | 209,872 | 19,246 |
| 1879 | 147,192 | 79,435 | 226,627 | 16,755 |
| 1880 | 150,134 | 86,399 | 236,533 | 9,906 |
| 1881 | 153,156 | 91,041 | 244,197 | 7,664 |
| 1882 | 161,377 | 95,055 | 256,432 | 12,233 |
| 1883 | 175,668 | 111,743 | 287,411 | 30,979 |
| 1884 | 181,355 | 110,150 | 291,505 | 4,094 |

* This is the increase over 1871.

Thus it will be seen that there has never been a retrogression in the total number attending; neither has there been in the number of white children in school. The only falling off in attendance was on the part of the colored pupils in the single year 1884. There were 1,593 more colored children in school in 1883 than in 1884.

One more brief table is necessary to conclude this part of the subject. It will compare 1873 and 1884 :

| Year. | Enrollment. | | | Increase of 1884 over 1873. | | |
|-------|-------------|----------|---------|-----------------------------|-------------|-----------|
| | White. | Colored. | Total. | In White. | In Colored. | In Total. |
| 1873 | 63,922 | 19,755 | 83,677 | ..... | ..... | ..... |
| 1884 | 181,355 | 110,150 | 291,505 | 117,433 | 90,395 | 207,828 |

A few brief sentences should be devoted to the school systems under special laws. In 1873, the counties of Bibb, Chatham, Glynn and Richmond, and the cities of Atlanta and Columbus, had special school systems. The first of these to be established was

that of Chatham, which antedated the first general public school law. The others followed in rapid succession. A magnificent work has been done in these localities for years past. In 1884, in addition to those just named, local laws and organized schools existed in the following cities: Americus, West Point and Sandersville, these systems having been organized under special laws enacted from time to time. In 1885, public schools were organized in Rome, and a system has just been inaugurated for the city of Griffin. Density of population and adequate resources, through the power of local taxation, have made these systems the pride of the State. Increased school funds for the entire State will give results approximately as successful throughout every school district in Georgia.

In 1884, the schools under local laws furnished instruction to 13,672 white, and 10,646 colored pupils, making a total of 24,318. They received from the State School Fund \$43,565.88, and realized from their own resources \$181,917.30, making the total of their school fund \$225,483.18.

One word, in conclusion, in reference to colleges and private schools. In 1884, there were reported to the State School Commissioners, 34 universities and colleges, male and female, white and colored. Of these three were medical colleges, one a business college, and three were for colored pupils. The total attendance was 5,247. These figures do not include the State University, which was not reported.

There were reported, in the same year, 153 private high schools, with 12,397 pupils in attendance. All these, save two, were white schools.

From a rare volume, viz.: a report made to the General Assembly by Hon. D. W. Lewis, then of Hancock county, it appears that in the year 1860, a year of prosperity almost unequalled in our *antebellum* history, there were only 96 academies in the State. It may be that this report did not show all these institutions then existing; it is certain that all the high schools of 1884 were not reported to the State School Commissioner.

There is no method of ascertaining the number of private elementary schools in the State. The teachers fail to report them and there is no mode of compelling them to do so. Year after year the report of the State School Commissioner goes to press with coun-

ty after county left blank in the table devoted to this class of schools.

A diligent inquiry made by him in 1883 of the County School Commissioners disclosed the fact that there were in the State 1,225 private elementary schools kept up for six months of the year, wherein white children were instructed, and 263 for colored children. Doubtless the same was approximately true for other years before and since.

From this brief *resume* it will appear that for the amount of its school fund Georgia has done a remarkable work in the way of educating the masses. With the increased fund which may with confidence be looked for in the near future, the wise modes of economy learned in the past will doubtless continue to prevail and results of the greatest magnitude will follow.

UNIVERSITY OF GEORGIA—P. H. MELL, D.D., LL.D., CHANCELLOR.

In the year 1784, the Legislature of Georgia passed an Act, approved February 25th of that year, laying out what were then called the counties of Franklin and Washington, though the territory embraced includes perhaps as many as a dozen or more of the present counties. The 11st section of this Act conveyed forty thousand acres of these lands, then wild, to the Governor for the time being, and certain other persons named in trust, for the endowment of a college or seminary of learning, there being at that time no such institution in existence. This was the germ. In the following year, 1785, an Act was passed, approved on the 29th day of January, by which a charter was granted to the persons above spoken of, and certain others named in addition, as trustees of an institution to be established and to be called "The University of Georgia."

The institution existed only on paper, until the year 1801, when Governor John Milledge gave to the trustees, for the benefit of the University, six hundred and thirty acres of land, on a part of which the University buildings are now situated, and on a part of which, also, a large portion of the city of Athens is now built. The original intention of the Legislature was to erect buildings for the University at Louisville, in Jefferson county, but the donation by Governor Milledge changed the plan.

Soon after this, the institution went into operation, and was sustained partly by the rent of the lands given to it by the State. In

that early day English ideas prevailed largely among our fathers, and it was thought that a long *rent roll* was the best of all endowments. Experience soon proved that in this new country the renting of lands was not profitable; and some of the lands were sold, and the College was sustained from the proceeds. It was soon discovered that this plan was also unwise, and afterwards the lands were all sold, payment being made in the notes of the purchasers, secured by mortgages.

By the Act of December 16th, 1815, the State authorized the Governor to advance to the Trustees any amount of money, not exceeding two-thirds of the amount called for by these notes, and to receive the notes in lieu of the same. One hundred thousand dollars was the sum agreed upon; but, as the money was not paid, this amount was regarded as a debt due to the University by the State, and it was agreed that the interest should be paid upon the same at the rate of eight per cent. In compliance with this arrangement, the sum of eight thousand dollars has been annually paid by the State to the University regularly, down to the present day.

In 1830, one of the main College buildings, including the Library and a portion of the apparatus, was destroyed by fire; and to replace the loss thus occasioned, and, also, to aid in current expenses, a donation was made by the Legislature of \$6,000 a year, and this was continued from 1830, to 1841. From this time until 1875, a period of thirty-four years, nothing was done for the University by the State. In February of that year an Act was passed, giving \$5,000 a year for three years to the "Georgia State College of Agriculture and the Mechanic Arts," which is a branch of the University, the origin and history of which will be hereinafter set forth.

In 1875, the Legislature, appropriated \$15,000 to the University, for furniture, apparatus and general outfit of the State College of Agriculture and the Mechanic Arts. In 1881, an Act was passed giving to the University \$2,000 to enable the Trustees to inaugurate free tuition; and in 1883, the sum of \$3,000 was donated for the purpose of repairing the buildings. So far as it is known the University has received from the State no benefactions other than those mentioned.

Donations by Dr. William Terrel, the city of Athens and Senator Joseph E. Brown: In 1854, Dr. William Terrel, of Hancock

county, bequeathed to the University \$20,000, which it still retains, and in 1873, the city of Athens gave the institution \$25,000 for the erection of the new building now known as "Moore College."

In 1883, Senator Joseph E. Brown gave to the Trustees the sum of \$50,000, which was to be invested in seven per cent. bonds of the State of Georgia, and the interest to be devoted to educating worthy young men, who were too poor to pay their own way. Quite a number of young men are now taking advantage of this fund, both at Athens and Dahlonega.

By good management the Trustees have, in various ways, increased the funds of the institution, so that they are now larger than would appear from the above record.

FOUNDING OF THE STATE COLLEGE.

By an Act of the Congress of the United States, approved July 2d, 1862, there was given to each of the States, for educational purposes, an amount of land, equal in quantity to 30,000 acres, for each Senator and Representative to which said States were entitled under the apportionment of 1860. The State of Georgia, by the Act of March 10, 1866, accepted this grant of land on the conditions specified in the grant, and by the Act of December 12, 1866, the Governor was empowered to receive and sell the scrip representing said land, and to invest the proceeds for the purposes mentioned in the grant. On the 30th day of March, 1872, his Excellency, James M. Smith, Governor of Georgia, transferred the fund thus obtained to the Trustees of the University of Georgia; and on the first day of May, 1872, the said Trustees opened and established the "Georgia State College of Agriculture and the Mechanic Arts," the said institution being an integral part of the University of Georgia, controlled by the Trustees of the latter, and presided over by the Chancellor of the University.

MEDICAL DEPARTMENT.

In the year 1873, the University entered into an arrangement by which the distinguished and successful "Medical College of Georgia," at Augusta, should become one of the departments. The Chancellor attends the commencement of the College, and in the name of the University confers the degrees.

BRANCH COLLEGES.

Soon after the receipt of the Agricultural Land Scrip Fund, the Trustees adopted the policy of aiding in the support of "Branch Colleges," located in various parts of the State. Four such colleges have been organized, and are in successful operation at Dahlongega, at Milledgeville, at Cuthbert, and at Thomasville, respectively. The one at Dahlongega is authorized to conduct students to graduation, and the Chancellor of the University confers the diplomas. The others are permitted to conduct pupils only to the end of the Sophomore year, after which it is expected that they will repair to the parent and central institution.

Two of these "Branch Colleges," viz: those at Dahlongega and Milledgeville, are mixed schools of males and females. It is a common thing for the degree of Bachelor of Arts to be conferred on ladies at Dahlongega.

Under the University system, then, there are two colleges and a law department at Athens, the medical department at Augusta, and the four branch colleges named above.

There are local boards at the four "Branch Colleges," whose actions must be ratified by the Central Board of Trustees, and the Chancellor has a general supervision over all the colleges.

There were reported as being in attendance in all the colleges and departments last year, 1,097 students.

ASSETS.

The assets of the University amount to about \$650,000. This does not include the value of the land belonging to the University.

The campus contains 37 acres, and at "Rock College" there is a small experimental farm of 16 acres.

THE LIBRARY

Contains about twenty thousand volumes. No reliable estimate of its value can be made.

SUSPENSIONS.

In 1813, college exercises were suspended in consequence of the war with Great Britain.

In 1817, 1818 and 1819, from inability to organize the faculty in a manner satisfactory to the Board of Trustees, the exercises of the University were again suspended.

In September, 1863, the Chancellor and Faculty, and nearly all the students, joined the Confederate army, and college exercises were consequently suspended. They were resumed January 1, 1869.

COLLEGE CURRICULUM.

In 1869, what is known as the "Old College Curriculum" was for the most part displaced by giving the students, on certain conditions, an elective course of study, and by establishing various other degrees in addition to those formerly conferred. Since that time the new system, known as the University system, has been in force. Besides the old A. B. course, six other courses, ending in degrees, have been prescribed, from which students can take their choice.

APPARATUS.

The University of Georgia is said to have the finest Physical and Chemical Apparatus in the South. It is also well supplied with engineering models, machines for testing the strength of materials, etc., and sends forth each year skilled Chemists, Mining and Civil Engineers, Lawyers, Doctors, Agriculturists, and Teachers.

Large numbers have graduated from the University, and many of its alumni have been prominent both in the State and Federal Governments. Among others, there have been thirty or forty members of Congress, one Judge of the Supreme Court of the United States, a Secretary of the Treasury, eight Judges of the Supreme Court of Georgia, and two of the Supreme Courts of other States, five Speakers of the House of Representatives of Georgia, forty or fifty Judges of the Superior Courts, three Governors of States, and one of Liberia, a Bishop of the Methodist Episcopal Church, and one of the Protestant Episcopal Church, and a Speaker of the House of Representatives.

TUITION.

Tuition is now free in all departments of the University, except the Departments of Law and Medicine, without reference to place of birth or of present residence of students.

PRESIDENTS AND CHANCELLORS.

The first President of the University was Josiah Meigs, LL. D., who was elected in 1801, and resigned in 1811. He was succeeded the same year by John Brown, D. D., who continued President until 1816, when he resigned. Rev. Robert Finley, his successor, died in 1817. There was an interregnum till 1819, when Moses Waddell, D. D., was elected and continued in office till 1829. Dr. Waddell and his sons have ranked among the ablest educators in the South.

Alonzo Church, D. D., followed Dr. Waddell in 1829, and continued in office until 1859. The title was then changed to that of Chancellor, and Rev. Andrew A. Lipscomb, D. D., LL. D., was Chancellor from 1860 to 1874; he was succeeded by Rev. Henry H. Tucker, D. D., LL. D., who had previously been President of Mercer University, and who held the position from 1874 to 1878, when the present incumbent, Rev. P. H. Mell, D. D., LL. D., was elected.

EMORY COLLEGE—OXFORD.

Emory College is located in the town of Oxford, Newton county, forty miles east of Atlanta, and one mile from the Georgia Railroad. The town is on a high granite ridge, beautifully shaded, with the purest water, and is in every particular an ideal site of an institution of learning.

The college is the joint property of the North Georgia, South Georgia and Florida Conferences of the Methodist Episcopal Church, South. It was founded in 1837, and was originally located at Covington. Its first Board of Trustees consisted of Ignatius A. Few, Elijah Sinclair, Charles Hardy, Samuel J. Bryan, Alexander Speer, Lovick Pierce, David P. Hillhouse, Charles H. Sanders, William P. Graham, Lucius L. Wittich, Iverson L. Graves, George F. Pierce. Its first President was Ignatius A. Few, who was succeeded, in the order named, by A. B. Longstreet, George F. Pierce, Alexander Means, James R. Thomas, Luther M. Smith, O. L. Smith, Atticus G. Haygood, I. S. Hopkins.

Its present corps of instructors numbers fifteen, representing, in addition to an Academic Course of the highest grade, a Commercial School, a School of Telegraphy, a School of Law, and a School of Tool-Craft and Design.

The college numbers about 750 alumni, and the average attendance during the past few years has been 300.

The college buildings are situated in a grove of oak and hickory of original growth, the grove embracing an area of forty acres. Of these buildings there are six, notably among which is Seney Hall, the gift of Mr. George I. Seney, of Brooklyn, New York. Besides the college buildings proper, there are two society halls, belonging respectively to the Few and Phi-Gamma Literary Societies. The buildings and endowment of the institution represent a value of \$225,000.

The students board for the most part in private families in the town. In addition to the ample facilities for board thus offered, a very prominent feature of the institution is its system of Helping Halls. Of these there are five, located in different portions of the town. They make it possible for young men to live very cheaply, without interference with college duties.

While Emory College has furnished the State and country at large with leading men in all ranks of public and private life, it is the peculiar glory of the institution that it makes higher education possible to young men of limited means.

MERCER UNIVERSITY—MACON.

Mercer University has had an honorable career of forty-seven years. Evolved from a classical school in the village of Penfield, Greene county, known as Mercer Institute, and formally organized in 1838, it has become one of the most flourishing and influential colleges in the South, and a potent factor in the educational progress of Georgia. It is a denominational school under the control of the Georgia Baptist Convention, a body which chooses its Board of Trustees, by whom its Faculties are elected, its policy regulated, and its finances managed.

The most distinguished of its originators and promoters was Rev. Jesse Mercer, D. D., a Baptist minister of great ability and active piety, whose intelligent views, active labors and generous gifts made him easily first among his colleagues, and marked him as most worthy to give name to the infant college.

The leading idea in the establishment of Mercer University was to afford the advantages of Christian education to the sons of Geor-

gia, and to furnish an intellectual and theological equipment to young men contemplating the gospel ministry.

The University embraces three departments: 1. The College of Liberal Arts. 2. The Department of Theology. 3. The Law School.

In the college, students have choice of two courses of study—each a complete curriculum, viz.: The Classical and the Scientific. Success in the former wins the A. B. degree; in the latter, the B. S. degree.

In the Theological school the graduates receive the degree of Bachelor of Theology. In the Law School graduates receive the degree of Bachelor of Law, and are entitled to practice in any of the courts of the State without further examination.

Mercer University has contributed to the pulpit, the bench, the halls of Congress and of State Legislatures, the Executive chairs of States, the professional chair, and to the various professions and occupations of life, a number of the most distinguished, cultivated and successful men of the day. It has been an efficient agent in elevating and strengthening the denomination under whose auspices it was established, and has borne a most honorable part in developing an intelligent citizenship in the State.

In its history it has had six Presidents, viz.: Rev. B. M. Sanders, Rev. Otis Smith, Rev. J. L. Dagg, D. D., Rev. N. M. Crawford, D. D., Rev. H. H. Tucker, D. D., LL. D., and the present incumbent, Rev. A. J. Battle, D. D., LL. D., who was elected in 1871.

Penfield was the seat of the University from 1838 to 1871. In the latter year it was transferred to Macon, a city noted for its healthfulness, its culture and its encouragement of educational enterprises.

On its removal hither, the city donated \$125,000 in bonds for the erection of buildings and an eligible site near the western border. The plateau on which the University stands is elevated and salubrious. The grounds have been beautified and are an attractive object to visitors. Malarial diseases are unknown and the residents enjoy an unusual exemption from disease.

The property of Mercer University is estimated at \$300,000. It has excellent buildings, apparatus and libraries. The Faculty are experienced and accomplished instructors, and several of them are noted authors. Its alumni fill important positions in Church and State.

WESLEYAN FEMALE COLLEGE—MACON.

This college was chartered by the Legislature of Georgia in the year 1836. About this time, there was a wonderful awakening throughout the State on the subject of higher education. Up to that time, there was only one college in the State. Franklin College at Athens, Emory College at Oxford, Mercer University at Penfield, Oglethorpe University at Midway and the Georgia Female College at Macon came into being almost simultaneously.



WESLEYAN FEMALE COLLEGE.

It is well known that this is the oldest chartered college in the world for graduating ladies. The founders of this "Mother of Female Colleges" were doing a greater work than they even suspected. Who originated the idea of this Female College? Several very positive and perfectly contradictory statements have been made in answer to this question. Suffice it to say, that in the order of God's providence the time had come, and the design was *somehow* put into the hearts of men competent to initiate and carry forward the grand enterprise.

The projectors of the college, while as yet it existed only in *purpose*, offered to place it under the fostering care of the Georgia Conference of the Methodist Episcopal Church. The offer was cordially

accepted, and Dr. Lovick Pierce was appointed by the Conference to serve as traveling agent.

The first official record is of the following names, appointed in 1836, to act as Trustees for the college: James O. Andrew, John W. Talley, Samuel K. Hodges, Lovick Pierce, Ignatius A. Few, Alexander Speer, William Arnold, Thomas Samford, William J. Parks, George F. Pierce, Elijah Sinclair, Henry G. Lamar, Jere Cowles, Ossian Gregory, Robert Collins, E. Hamilton, George Jewett, Henry Solomon, Augustus B. Longstreet, Walter T. Colquitt, James A. Nisbet, Robert Augustus Beall. Encampment Hill, since known as College Hill, overlooking the city of Macon and the surrounding country, was chosen as the site of the college. This location is unsurpassed, both for healthfulness and for beauty.

The Board of Trustees held many meetings and had many interesting discussions as to the plan of the building, the ways and means of erecting it, the adoption of the curriculum, etc. Being pioneers, the rareness of their mistakes is wonderful. Two years after their organization, viz., in June, 1838, they elected the first President of the college, the late Bishop Pierce, and soon afterwards they chose five additional Professors and two lady assistants—also a Steward and a Matron.

The college was formally opened and began its appropriate work January 7th, 1839. The opening of a college for women, even at that time, was recognized as an important event in the history of the age. A large number of citizens assembled in the College Chapel to witness the opening scene. The hopes and plans of the friends of the college, the speculations of its enemies and the eager delight of the congregated pupils, all conspired to invest the occasion with an interest additional to its intrinsic importance. On that day *ninety* young ladies enrolled their names as pupils; during the first term, the number increased to *one hundred and sixty-eight*.

But the views and plans of the Trustees were too liberal for their age, or at least for the cramped financial condition of the times. Debts accumulated; creditors threatened to close the doors of the college. The Georgia Female College was actually sold and bought at sheriff's sale and given to the Georgia Annual Conference of the Methodist Episcopal Church, and then its name was changed to Wesleyan Female College.

The munificent gift of over \$100,000, by Mr. George I. Seney, of

Brooklyn, New York, has enabled the Trustees to make such additions and changes in the main college building as to render it the most elegant and complete edifice, for educational purposes, North or South. This building is 246 feet long and 85 feet deep. It is five stories high, including mansard, and has ample upper and lower colonnades. Arcades, stairways, transoms over every door, and broad passages throughout the entire building give perfect ventilation, and the house throughout has every modern convenience and comfort. There are two other buildings on the college lot, used as Chapel, Laboratory and Recitation Rooms.

The course of study embraces the English, Latin, Greek, French and German languages, a full course of Mathematics, the Natural Sciences, Mental and Moral Philosophy, Logic, Evidences of Christianity, Parliamentary Law, Ancient and Modern History, Elocution and Composition. The Music course embraces Piano, Guitar, Organ, Voice Culture and Harmony. The Art Department includes every style of Drawing and Painting, China Decoration and Embroidery.

In 1840 the college graduated its first class of eleven young ladies, and it has graduated a class every year since. The number of graduates in the Literary Department is *one thousand and fifty-six*. The number of graduates in Music is *fifty-one*. In addition to those who have taken degrees, *thousands* of young ladies have received a good education here, who have stopped short of graduation.

The following distinguished gentlemen have been, in the order named, Presidents of the Board of Trustees: Bishop James O. Andrew, Bishop George F. Pierce, Dr. William H. Ellison, Hon. Thaddeus G. Holt, Hon. Barnard Hill, Hon. James Jackson, Dr. James E. Evans, Dr. W. H. Potter. The Presidents of the college have been Bishop Pierce, Dr. W. H. Ellison, Dr. E. H. Meyers, Dr. O. L. Smith, Dr. J. M. Bonnell, Dr. W. C. Bass. Dr. Bass has been President of the college since 1874. Dr. C. W. Smith has been Secretary of the Faculty since 1852.

The number of pupils in the college for the session ending in June, 1885, was *two hundred and ninety-six*—the number of Professors, Teachers and Officers, *eighteen*—five gentlemen and thirteen ladies.

The Endowment Fund of the college is *fifty thousand dollars*—all given by George I. Seney.

ATLANTA UNIVERSITY*, ATLANTA.

This school was established by the American Missionary Association, assisted by the Freedmen's Bureau, and was chartered in 1867.

Its courses of study are the grammar school, the normal and the classical. Graduates from the last receive the degree of A. B. In connection with these courses, systematic instruction is given in cooking, sewing, dress-making, washing, and nursing; also in farming, gardening, and tree culture; also in wood working and metal-working. For mechanical instruction a brick three-storied building, 44x100, has been erected, in which are shops for competitory blacksmithing, wood-working and iron-working, machinery, and for other industries. Systematic instruction in these branches is made a prominent feature, without detracting from literary pursuits. The normal department trains students for the profession of teaching.

The institution has a library of 6,000 volumes, a large reading room, surveying instruments, a telescope, a microscope, and philosophical apparatus.

The catalogue of 1884-5 shows a faculty of seven male and twelve female instructors, and a membership of two hundred and ninety-seven pupils, from seven States and fifty-eight counties in Georgia.

The property of the institution is held by a Board of Trustees, and consists of sixty acres of land, a large school building, named Stone Hall in honor of its donor, a dormitory for girls and one for boys, and the Knowles Industrial building, all of brick, besides a large barn. The value of the whole property is about \$200,000.

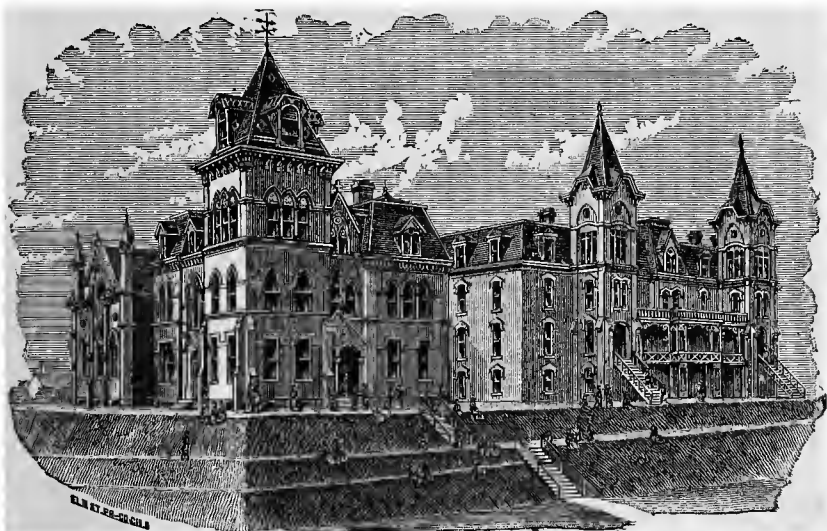
It receives from the State of Georgia an annual appropriation of \$8,000, and a larger sum from churches and individuals at the North.

Rev. E. A. Ware, A. M., has been President from the beginning of the school.

*This institution is for the special benefit of colored youths of both sexes.

SHORTER COLLEGE—ROME.

In the summer of 1873, several gentlemen of Rome, Georgia, organized a company and bought for school purposes the property known as "Shelton Hill," located in the centre of the city. Colonel Alfred Shorter was prominent in this organization, taking fifteen shares of the stock, and lending the influence of his well-known business capacity to the enterprise.



SHORTER COLLEGE.

In October of 1873, the "Cherokee Baptist Female College" was organized. Some changes were made in the buildings; the necessary school furniture and instruments were supplied, and good teachers were secured, thus offering at the beginning excellent educational advantages.

Rev. L. R. Gwaltney was elected President. He was assisted by Colonel D. B. Hamilton, Dr. J. W. Janes, Mrs. H. Cooper, Miss Sallie Hillyer, and Miss Kate Hillyer. In 1874 Professor A. B. Townes, of South Carolina, was chosen President. On his resignation the following year, the institution was again placed under the management of Rev. L. R. Gwaltney.

In 1876, Dr. Gwaltney resigned to accept the Presidency of the

Judson Institute, Marion, Alabama, and Rev. R. D. Mallery, of Albany, Georgia, was elected President. In 1877, the entire property was transferred to Col. Alfred Shorter. He removed every building from the hill and erected three large, elegant buildings, admirably suited for school work.

THE BUILDINGS

stand upon an eminence, commanding a view of the city and suburban villages, of the Etowah, Oostanaula and Coosa rivers, of lovely valleys, forest-clad hills, and distant mountain ranges—a combined prospect that charms the eye with ever fresh delight.

The views from the college tower call forth the enthusiastic admiration of all who visit the institution.

The main edifice contains the Memorial Chapel and thirteen rooms for college purposes.

The chapel has been elaborately finished. The ceiling and walls are adorned with paintings in fresco, and the windows are of stained glass. The Memorial Window, a beautiful specimen of art, is in memory of Mrs. Martha B. Shorter. On it are eight paintings, from Bible subjects, illustrating the life and rewards of a good woman.

Another building, three stories high, contains music rooms, study-hall, and art gallery.

The study-hall and recitation rooms are furnished with desks, maps, charts, globes, seats, etc., of the latest and most approved styles.

The boarding house is an elegant structure, containing thirty six rooms. These rooms are carpeted, neatly furnished, and thoroughly warmed and ventilated. All the buildings are heated by steam-pipes, and lighted with gas. Modern conveniences promote the health and comfort of the inmates.

A more beautiful situation for a college is not to be found in the State. It combines the advantages of pure water, pure atmosphere, a delightful climate, excellent social and religious advantages, and an industrious, enterprising community.

In 1882, Col. Shorter sent for Dr. Gwaltney, and asked him to return to Rome and again take the Presidency of the College. Dr. Gwaltney accepted the trust and entered upon his work in the fall

of 1882. The institution has grown steadily in public favor, and to day ranks among the best in the South.

YOUNG FEMALE COLLEGE—THOMASVILLE.

Major E. R. Young, a wealthy planter, of Thomas County, died in 1860, leaving a legacy of thirty thousand dollars to be used in the establishment and support of an institution for the education of females, to be known as "Young Female College," and appointing seven trustees of his own selection to carry out his wishes. There was a contest of the will, and no decision was had upon it until 1868.

The Board of Trustees organized June 23, 1866, when Mr. Thomas Jones was chosen President, and A. H. Hansell Secretary.

In February, 1868, the Board purchased the residence of Mr. James Kirksey, with fifteen acres of land attached, and engaged Mr. John E. Baker, formerly of Liberty county, to take charge of the institution, and it was opened that month. As soon as it could be conveniently done, a handsome chapel, with recitation and study rooms, was built, and the college entered upon a prosperous course. It has been the object of the trustees to furnish the means of a substantial and useful training, not neglecting the ornamental branches, but not by them to overshadow those deemed more important. While changes have occurred from time to time in the faculty, Mr. Baker has been continued as its head from its beginning, in 1868, to the present time, giving striking evidence of his faithfulness and fitness for his position. The college shows an attendance, from year to year, of over one hundred scholars, and the house of the President, who resides at the college, is full of boarding pupils from the adjoining sections of Georgia and Florida.

The trustees named in Major Young's will were Messrs. Thomas Jones, James T. Hayes, David S. Brannon, Wm. J. Young, James L. Seward, A. T. McIntyre and A. H. Hansell, of whom only the three last named are in life, and Messrs. T. C. Mitchell, T. E. Blackshear, H. J. McIntyre and James A. Brandon now fill the places of those deceased. The college has many alumni, who furnish in their daily lives the strongest evidence of the excellent training it affords, and its able President has the great gratification of seeing

the daughters of former pupils sent to be educated where their mothers had been, and gladly entrusted to his charge.

The college reflects credit upon the liberality and judgment of its generous and noble founder, and has performed a valuable part in aiding to build up the lovely little city in which it is located.

BUTLER FEMALE COLLEGE AND MALE INSTITUTE.

This institution, located in Butler, Ga., was organized under the name of "Johnston Institute," in the year 1872. By the action of the stockholders, in 1875, a charter was obtained and the name was changed to "Butler Female College and Male Institute." The original building, which cost about \$10,000, was burned in 1882, but was at once rebuilt upon an improved plan and supplied with the best furniture. By authority of an act of the Legislature of Georgia, the town of Butler has appropriated to this institution certain sums of money annually accruing from various sources, thus so greatly reducing tuition as to make it comparatively a free school. It is located on the highest elevation between Macon and Columbus, on the Southwestern Railroad, and a more healthful place cannot be found in Middle Georgia.

ANDREW FEMALE COLLEGE—CUTHBERT.

This institution, designed for the higher education of females, was established in the year 1853. It is the property of the M. E. Church, South. Though belonging to a religious denomination, sectarian views have at no time been taught by its faculty. Never in its history was Andrew College upon a firmer basis, or enjoying more fully the public confidence. This is one of the first colleges for young ladies in the South. Its course of study is equal to that of any in the State, and its faculty is composed of thoroughly trained gentlemen and ladies. The buildings are handsome and the surroundings beautiful. The work done by the college is thorough in all its departments, as attested by the many brilliant graduates who have gone forth to adorn society and illustrate their Alma Mater. Andrew College is now under the Presidency of the Rev. Howard W. Key, A. M., a ripe scholar, an experienced teacher, and admirable disciplinarian.

CLARK UNIVERSITY*—ATLANTA.

This institution is supported by the Freedmen's Aid Society, a charitable organization of the Methodist Episcopal Church.

It was begun in 1869 as a primary school, with a department for the training of preachers. It was chartered as a University in 1877. The school occupied a small building on Whitehall street till 1880, when it entered the beautiful premises at the southern end of Capitol avenue.

The property, land and buildings, is valued at \$120,000, which is a low estimate. There are two four-story brick buildings, 100x50, ten frame cottages, two shops, and four hundred and fifty acres of land. There are eight courses of study, taking students from the elementary branches through to the regular University degrees. The theological school is endowed, possesses a fine library, and receives students from nearly every Southern State. The industrial department is made a specialty. This includes carpentry, carriage building, housekeeping, dressmaking, printing, harness and shoe making.

There are ten teachers and an annual attendance of about three hundred.

THE METHODIST COLLEGE—GAINESVILLE,

Chartered in 1881, with full college powers, and established for the education of young ladies. Its officers are a President, Secretary and Faculty, supervised by a chartered Board of Directors, and visited by a Board of Visitors, appointed by the North Georgia Conference of the Methodist Church, South, under whose fostering care the College is operated. It has authority to confer all the college degrees, both literary and honorary, and the aim of the institution is to impart to its students a thorough, liberal and practical education.

Gainesville, the city in which this college is located, is fifty-two miles north of Atlanta, on the Richmond & Danville Railroad, and it is believed that no village, town or city in Georgia combines so many advantages for a college as Gainesville. The air is salubrious, the water pure and cool, and the society good. Many years of experiment have satisfied the people of lower Georgia, Florida and Alabama that no locality this side of the Blue Ridge presents so

*For colored students.

many attractions to the invalid for summer resort as Gainesville and its vicinity. It is, beyond a doubt, one of the healthiest localities in the world.

The college year begins on the first Wednesday in September, and closes on the second Wednesday in June. The expenses for board, literary tuition and music are \$20 per month—\$200 per year.

Written examinations are held at the close of each year, or oftener, as the President may see fit.

Special attention is drawn to the completeness and thoroughness of the course of study prescribed; yet patrons have the privilege of selecting the course of study they consider best suited to the capacities of their children. All the accomplishments of an education can be obtained here as fully as in any institution. Peculiar advantages are afforded to secure an education to meet the wants of the times and the demands of the future. This location is peculiarly adapted to those disposed to be studious. A distinguished physician, who has tested the matter to his satisfaction, has said that the climate here is better adapted to Southern girls than Tennessee or Virginia. For those who live in Mississippi, Louisiana, Texas, Florida, Alabama and Georgia, there is no locality better than this.

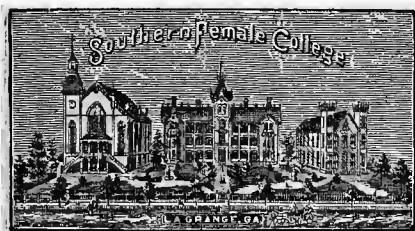
Rev. C. B. LaHatte is President of the college, Judge J. B. M. Winburn is Secretary of the Faculty, Mr. Jno. A. Smith is President of the Board of Directors, Mr. W. B. Clements is Secretary of Board of Directors, Rev. W. A. Dodge is pastor.

THE SOUTHERN FEMALE COLLEGE—LAGRANGE,

Was organized in 1843, by Rev. J. E. Dawson, D. D., as a school of high order for the education of young ladies. Dr. Dawson, however, was shortly succeeded by Milton E. Bacon, A. M., whose first class of five young ladies graduated in 1845. Under Mr. Bacon's administration the college rapidly grew into favor, the graduating classes, and the attendance on the various departments of instruction, increasing from year to year. Large and beautiful buildings were erected for the various departments of instruction, and for the accommodation of the boarders, who came in large numbers from this and adjoining States. President Bacon retired from the college in 1855, and was succeeded by John A. Foster,

A. M., who remained in charge till 1857; was succeeded by I. F. Cox, A. M., the present President.

The college buildings were destroyed by fire in 1860, but President Cox, with persistent, indomitable energy kept up the organization of the college in spite of obstacles that seemed insurmountable, and with the returning prosperity of the country, assisted by the liberal and progressive citizens of LaGrange, he erected the magnificent buildings now used by the college,



and supplied the various departments—literary, music and art—with an outfit commensurate with the demands of this age of progress and intellectual activity.

The college for nearly a quarter of a century has been under its present management. Its influence extends to all parts of the South. The graduates, to the number of 400, are found in every part of the country, filling the highest social positions, and in their literary, music and art training beautifully illustrating the work done by their *alma mater*.

The last catalogue of the college for the year closing 1884 gives the names of 155 pupils, with 115 in music and 35 in art. The advantages for music offered here are believed by the best critics to be unequalled in the South.

GRIFFIN FEMALE COLLEGE—GRIFFIN.

This institution is situated in the beautiful and healthy city of Griffin, and has been incorporated thirty-six years. It occupies almost an entire square, in the best part of the city, standing in a beautiful grove of ten acres. The college has been patronized from almost all parts of the South, and its graduates are to be found in every direction. The course of instruction is of the most exact and thorough character, and strictly progressive, commencing with the simplest elements of knowledge and extending through a complete college curriculum. The college is vested with chartered rights, and is empowered to grant diplomas to those who accomplish

the prescribed course of study. The school of instrumental and vocal music is especially fine, and every opportunity for thorough musical culture is afforded.

The college possesses a fine chemical and philosophical apparatus, a cabinet of minerals and a valuable library. The well known purity of the air, the freedom of Griffin from all miasmatic influences, together with the cultured character of its society, render this a most desirable location for an institution of learning, as all its surroundings are of a high character.

MEDICAL COLLEGES.

THE MEDICAL COLLEGE OF GEORGIA constitutes the Medical Department of the State University. The college has a distinct Board of Trustees, of which Hon. Joseph B. Cumming is President and Thomas B. Phinizy, Secretary.

This institution has enjoyed an honorable distinction for a period of more than fifty years, and has graduated in medicine more than fifteen hundred young men during that period. It was founded in 1829, as a Medical Academy, and, with the exception of the war periods, its sessions have been uninterrupted. In 1873, on account of its extended reputation and the advantages afforded for clinical instruction in a larger city than Athens, the college became the Medical Department of the University, and its graduates have their degrees conferred and their diplomas signed by the Chancellor.

George W. Rains, M.D., LL.D., is Dean, and Robert C. Eve, M.D., is Secretary of the Faculty.

ATLANTA MEDICAL COLLEGE.—This is the oldest institution of learning in the city of Atlanta, having been organized in the year 1855. With the exception of a few years during the late war, it has been in successful operation since its first establishment. The total number of graduates during the period of its existence is more than one thousand.

The college has a fine museum and offers excellent clinical advantages.

The Board of Trustees, with Joseph Thompson, M.D., President, and J. S. Pemberton, Secretary, embraces some of the most prominent citizens of Atlanta.

H. V. M. Miller, M.D., is Dean, and James A. Gray, M.D., Proctor of the Faculty.

GEORGIA ECLECTIC MEDICAL COLLEGE.—This college was organized under the auspices of the Georgia Eclectic Medical Association in June, 1877. It claims to have the finest museum south of the Potomac, an unequaled laboratory, and a well organized corps of instructors in every department of the medical course.

Josephus Adolphus, M. D., is Dean of the Faculty.

RELIGIOUS DENOMINATIONS.

METHODIST EPISCOPAL CHURCH, SOUTH.—In 1844, Episcopal Methodism in the United States divided on the slavery question. There were other and material matters of difference, but this was the main rock on which the church split. The Southern Conferences, according to the plan of separation, were organized into a separate jurisdiction, and adopted the name as above.

The first Methodist preacher who labored in Georgia was Beverly Allen, who reached the State in 1785, one hundred years ago. In 1786, Thomas Humphreys and John Major were appointed to labor in the State. At the end of twelve months, they reported 430 members, the majority of them in Wilkes county. The first Presiding Elder's district was organized in 1787, with Richard Ivy in charge. The first session of an Annual Conference on Georgia soil was held and the first visit of a Bishop was made in March, 1788. The Bishop was Francis Asbury, and the Conference, which was for both South Carolina and Georgia, was held near the fork of Broad and Savannah rivers, and in what is now Elbert county. For fifty years Georgia was included in the South Carolina Conference. The Georgia Conference was organized January 5th, 1831. In 1834, the statistics were, white members, 24,336; colored, 7,421; travelling preachers, about 90. In 1866, the membership was as follows: traveling preachers, 230; local preachers, 527; colored local preachers, 18; white members, 51,219; colored members, 14,993. In that year the old Conference was divided into the North Georgia and the South Georgia Conferences. The combined statistics for the two Conferences for 1884 are—Presiding Elders' districts, 20; pastoral charges, 304; churches, 1,129; traveling preachers, 361; local preach-

ers, 615; members, 107,523; Sunday-schools, 1,101; officers, teachers and scholars, 63,475; infants baptized, 2,998; adults baptized, 6,817; net increase of members in one year, 5,087; church sittings, 327,845; values of churches, \$1,237,605; parsonages, 157; value of parsonages, \$212,590; value of other church property, \$550,407; total value of church property, \$2,000,602; contributed for elders, \$22,331; contributed for support of 304 pastors, \$154,377; contributed for Home Missions, \$11,260; contributed for superannuates, \$13,704; total amount raised for support of 361 traveling ministers, including the disabled, \$201,672; average amount paid to the ministers, \$558; contributed for Foreign Missions, including amount raised by the woman's societies, \$35,097.

From the foregoing, it will be seen that the membership has grown from 51,219 in 1866 to 107,523 in 1884, a period of eighteen years.

The church owns six colleges in the State: Emory, for males, at Oxford; Wesleyan Female, at Macon; LaGrange Female, at LaGrange; Dalton Female, at Dalton; Georgia Methodist, at Covington, and Andrew Female, at Cuthbert.

The *Wesleyan Christian Advocate*, at Macon, Georgia, with a circulation of 7,000 or 8,000, is mutually owned by the two Georgia and the Florida Conferences.

Long would be the list were all the strong men named who have blessed the church with their labors, and have given tone and character to Methodism in Georgia. Prominent, however, among them stand the names of Hope Hull, Lovick Pierce, George F. Pierce, William J. Parks, William Arnold, James O. Andrew, John W. Glenn, Samuel K. Hodges, Allen Turner, Ignatius Few, Samuel Anthony, A. B. Longstreet, Josiah Lewis, Jesse Boring and James E. Evans. The last two, in great age and feebleness, though still in the active work, are the only living members of the old guard. Among the present leaders are W. H. Potter, A. G. Haygood, I. S. Hopkins, John W. Heidt, H. H. Parks and W. F. Cook.

Georgia has contributed two men to the bishopric—James O. Andrew and George F. Pierce—while a third, Dr. Haygood, when elected to the office, declined the honor.

OTHER METHODIST CHURCHES.—In addition to the two great Methodist bodies in Georgia, the following may also be noted:

The Protestant Methodist Church, which has 45 ministers and

preachers, 2,048 members, 36 church edifices worth \$26,000, 21 Sabbath-schools with 984 scholars.

The Colored M. E. Church in America, was organized in 1870 by the Methodist Church, E. South, in the city of Jackson, Tenn. At the beginning the church embraced five Annual conferences and two bishops. It now numbers over 100,000 members, 4 bishops, 14 Annual conferences, two church schools, and about 2,000 preachers—local and itinerant. The following are the official statistics for the portion of the Church embraced within the limits of Georgia :

| | |
|-----------------------------------|--------|
| No. members..... | 15,339 |
| Itinerant preachers..... | 138 |
| Local preachers..... | 378 |
| Churches..... | 196 |
| One school—"The Paine Institute." | |
| Sunday-schools..... | 249 |
| Sunday-school teachers..... | 883 |
| Sunday-school scholars..... | 9,639 |

Zion Methodist Church, of which the statistics have been furnished.

The African Methodist Episcopal Church embraces the following :

| | |
|--------------------------|-----------|
| Members..... | 55,552 |
| Itinerant preachers..... | 500 |
| Local preachers..... | 775 |
| Church edifices..... | 550 |
| Preaching places..... | 800 |
| Seating capacity..... | 150,000 |
| Probable value..... | \$250,000 |

THE BAPTIST CHURCHES IN GEORGIA.—The "Regular" Baptists in Georgia are by far the most numerous denomination of Christians in the State, both among whites and negroes. The two races have separate organizations and associations, but are in close sympathy, holding the same doctrines and having the same form of government.

The following are the official figures for 1884:

WHITES.

| | |
|--------------------------------------|---------|
| Number of church edifices..... | 1,458 |
| Number of ordained ministers..... | 839 |
| Number of members..... | 113,010 |
| Number of Sunday-schools..... | 950 |
| Number of teachers and officers..... | 7,550 |
| Number of scholars..... | 39,000 |

NEGROES.

| | |
|--------------------------------------|---------|
| Number of church edifices..... | 1,231 |
| Number of ordained ministers..... | 800 |
| Number of members..... | 131,041 |
| Number of Sunday-schools..... | 500 |
| Number of officers and teachers..... | 4,500 |
| Number of scholars..... | 20,500 |

The total number of church edifices, including whites and negroes, may be put down at about 2,689, worth, probably, \$1,000,000, besides the ground attached.

EDUCATIONAL INSTITUTIONS.—Mercer University, located at Macon; Shorter College (female), at Rome; Southern Female College, at La-Grange, are the property of the Baptists of Georgia; and there are several other institutions of high grade in the State more or less closely connected with this denomination.

THE CHRISTIAN INDEX, published by James P. Harrison & Co., Atlanta, and edited by Rev. H. H. Tucker, D. D. LL. D., a long established and the leading Baptist newspaper of the Southern States, is the recognized organ of the Georgia Baptists.

HISTORICAL.—There have been Baptists in Georgia ever since its first settlement in 1733.

Kiokee, the first regularly constituted church, was established in 1772, under the instrumentality of Rev. Daniel Marshall, on the ground where the town of Appling now stands. In 1773, the Botsford Church, twenty-five or thirty miles below Augusta, was formed by Rev. Edmond Botsford, an Englishman who was sent out as a frontier missionary by the Charleston Baptist Church. Rev. Daniel Marshall, however, was the great pioneer Baptist preacher of Georgia, and his zeal and usefulness were most successfully emulated by his son, Rev. Abraham Marshall, who succeeded him in the pastorate of Kiokee Church.

In 1784, there were six or eight Baptist churches in the State, and that year the first Association was formed, including five churches.

In 1788, the number of churches had increased to 32, with 2,877 members. In 1790, there were 40 churches, with 3,211 members; and in 1790, 75 churches, with nearly 5,000 members, when the second Association was formed. From this date on, the churches rapidly increased in numbers and membership, especially in the mid-

the portion of the then settled State, and extending southwardly and westwardly, the churches being chiefly in the country. The church in Savannah was constituted in 1800, and that at Augusta in 1817.

The men who were prominent in laying the foundations of the denomination in Georgia were Daniel Marshall and his son, Abraham Marshall, already mentioned, Silas Mercer, Sanders Walker, John Milner, Sr., Jeremiah Reeves, Sr., Matthew Talbot, William Davis, Peter Smith, Wm. Franklin, James Matthews, and Alexander Scott. These were succeeded, in the early part of the present century, by a galaxy of men distinguished for their earnest piety and zeal, brilliant talents and grand eloquence. They were Henry Holcombe, Jesse Mercer, Jos. Clay, C. O. Screven, John Harvey, Jno. Robertson, Joseph Baker, Henry Hand, George Granbury, R. E. McGinty, John Ross, Edmund Talbot, Miller Bledsoe, George Franklin, Norvel Robertson, and John Stanford. These in turn were succeeded by W. T. Brantly, Adiel Sherwood, Jabez P. Marshall, Wm. Rabun, James Armstrong, R. E. McGinty, Wm. Williams, J. H. T. Kilpatrick, J. M. Gray, Cyrus White, Winder Hillman, Humphrey Posey, Elisha Perryman, Andrew Marshall, T. S. Wynn, Josiah Penfield, Charles J. Jenkins, and many others.

Prior to the war of secession, the leaders in the denomination were Thomas Stocks, B. M. Sanders, A. Sherwood, C. D. Mallary, J. L. Dagg, Jno. E. Dawson, J. H. Campbell, N. M. Crawford, P. H. Mell, T. J. Burney, Jno. B. Walker, Wm. H. McIntosh, Mark A. Cooper, H. Bunn, J. S. Callaway, V. R. Thornton, J. H. T. Kilpatrick, Absalom Janes, and many others, some of whom (not mentioned) are still active and prominent.

PRIMITIVE BAPTISTS.—In the year 1837, this denomination withdrew from the Baptist Church ("Missionary") on account of the introduction of the "new doctrine of Fuller, advocating a sort of general atonement, and of what they considered Arminian institutions, such as Union Sunday-schools, Bible and tract societies, Theological Schools," etc. The prominent actors in that day were Reverends Rhodes, Calley, Montgomery, Henderson, Moseley, Lumpkin, Ellis, Parker, Battle, Patman, Cleveland, Burnett, Joice, Barker, Murray and others. The denomination numbers about 150 ordained ministers and 15,000 members, and has over 150 church buildings and 45,000 sittings.

The denomination owns no colleges or church property—other than the buildings mentioned—and publishes no denominational papers. The *Gospel Messenger*, owned and edited by John R. Respass, advocates the doctrines of this church, and has a growing circulation of 5,500.

THE PRESBYTERIAN CHURCH.—There are four separate and distinct branches of Presbyterians in Georgia, and they are here noted in the order of age.

1. *The Independent Presbyterian Church, of Savannah*, was organized in 1755. It has its chief strength in the city of Savannah, where it has two church edifices worth probably \$150,000, two pastors, 450 members, 390 Sunday-school teachers and scholars. The first pastor of this church was Rev. John Joachin Zuely, D. D., from Switzerland, and for two years a member of the old Continental Congress. Among its distinguished pastors were Rev. Henry Kollock, D. D., Rev. Willard Preston, D. D., and its present senior pastor, Rev. I. S. K. Axson, D. D. Dr. John Cumming, the Telfairs, Joseph Cumming, John Scriven, Francis Sorrell, G. B. Lamar, Matthew H. McAllister, John J. Stoddard, Dr. Joseph Habersham and Judge William Law, were among the most prominent laymen.

2. *The Associate Reformed Presbyterian Church*, commonly styled "Seceders," was planted in Burke county about the year 1760. From the best information, in the absence of official statistics, it appears that these have 8 or 10 churches, mainly in Burke, Jefferson and Newton, and perhaps one or two other counties, four or five ministers and about one thousand communicants. They are Presbyterians of the strictest sect, and have the same confession of faith and same form of government held by the great body of Presbyterians in the Old and New World. They, however, hold to restricted communion and use only the "Psalms of David in Metre" in worship.

3. *The Presbyterian Church in the United States*, usually called "The Southern Presbyterian Church," and sometimes styled "Old School Presbyterian Church," comprises the great mass of Presbyterians of Georgia. Before the American Revolution, there were in the State only two small and feebly organized societies of this order. In 1797, the first Presbytery was organized, embracing five ministers, 14 churches and about 300 members. In 1820, having lost largely by emigration, the little Presbytery contained only seven ministers,

25 small churches and 450 members. For the year 1884, the official figures give the following returns:

Ordained ministers, 72; organized churches, 161; communicants 9,245; Sunday-school scholars 6,353; officers and teachers, 803. There are about 170 church buildings, valued at \$525,000, and affording 75,000 sittings. The church owns one-fourth interest in the "Theological Seminary," at Columbia, South Carolina, which is valued—including all investments—at about \$330,000. There are no denominational colleges or schools in this State for secular education, the denomination having, some years since, abandoned that feature of its previous polity. Among the prominent ministers of this church, now deceased, were John Newton, John Springer—a grandson of Carl Springer, a count of Sweden—Moses Waddell, D. D.—John Brown, D. D., Alonzo Church, D. D.—the last named three were presidents of the State University from 1811 to 1859—Samuel Pressley, D. D., Nathan Hoyt, D. D., Francis Cummins, D. D., Thomas Goulding, D. D., C. C. Jones, D. D., C. P. Beman, D. D., and S. K. Talmadge, D. D.—the last two of whom were successive presidents of Oglethorpe University.

Among prominent laymen, now deceased, were Governors Jared Irwin, Matthew Talbot, George R. Gilmer, Herschel V. Johnson and Alexander H. Stephens; Judges William H. Crawford, Martin J. Crawford, Joseph H. Lumpkin, Eugenius A. Nisbet, Iverson L. Harris and General T. R. R. Cobb.

4. *The Cumberland Presbyterian Church*, which took its rise in a schism from the main body in 1810, in Kentucky and Tennessee, has only a few ministers and churches in Georgia and a small membership in the northwestern borders of the State, perhaps as many as eight or ten ministers and ten or fifteen churches in all. They are zealous and energetic, but less strictly Calvinistic than other Presbyterians.

THE PROTESTANT EPISCOPAL CHURCH IN GEORGIA.—This church commenced its work in Georgia in 1732, through Rev. Henry Herbert, who came over with the first emigrants. He was followed by Rev. Samuel Quincy in 1733, John Wesley in 1736, and George Whitefield in 1738. The only parish of which John Wesley and George Whitefield were ever rectors was Christ Church, Savannah.

Both John Wesley and George Whitefield established Sunday-schools in Georgia nearly fifty years before Robert Raikes origina-

ted the scheme of Sunday instruction in Gloucester, in England, and eighty years before a Sunday-school on his plan was established in New York.

In 1758, the Colonial Assembly divided the Colony into parishes.

The first Episcopal bishop who ever visited Georgia was Bishop Dehon, of South Carolina, in 1815, to consecrate the new church-building for Christ Church, Savannah, where he confirmed a class of sixty—the first confirmation ever held in Georgia.

The first Convention of the Diocese of Georgia was held at Augusta in 1823. Rev. Stephen Elliott was elected the first Bishop of the Diocese in 1840, and was consecrated in 1841. He was succeeded, in 1867, by Rt. Rev. John W. Beckwith, the present Bishop.

The Journal of the Convention of the Diocese, in 1885, shows 53 churches and stations; value of church property, \$451,210.00; communicants, 4,686; clergymen, 38; candidates for holy orders, 2; postulants, 2; lay readers, 4; Sunday-schools, 33—having 347 teachers and 2,981 scholars. Total contributions for the year ending May 1st, 1885, \$81,530.20.

THE CATHOLIC CHURCH.—The first Catholic Church established in Georgia was at Locust Grove, Taliaferro county, seven miles from Crawfordville, by a colony of Catholics from Maryland, in 1794. Soon after, a number of Catholics, refugees from the terrible massacres of San Domingo, came to America, and many of them settled in Savannah and Augusta, where they were kindly received. A priest of these refugees was the first Catholic clergyman that ever officiated in Georgia. At this time Georgia and both the Carolinas were subject to the See of Baltimore, Bishop Carroll, and so continued until July, 1820, when the three States were united in a distinct Diocese under the care of Dr. John England, who was the first Bishop of Charleston.

Bishop England was a man of great learning, a wonderful preacher, very zealous and laborious, and very liberal toward other denominations. He died in 1842. In 1850, the State of Georgia was erected into a distinct Diocese, and Rev. Dr. Gartland appointed the first Bishop of Savannah. After his death, he was succeeded by Bishops Barry, Verot and Persico; and on April 27, 1873, by Rt. Rev. Wm. H. Gross, who has recently resigned.

The Catholics have in the State 30 churches, 40 chapels and stations, 27 priests, 1 male college (Pio Nono College, at Macon), and

3 orphan asylums, caring for 110 orphans. The Catholic population of the State is twenty-five thousand.

UNITARIAN CHURCH.—There is but one organized congregation of this faith in the State, and it was organized in 1883, in the city of Atlanta, by Rev. George L. Chaney, formerly of Boston, Mass. Congregations once existed in Savannah and Augusta, but they are no longer active. It is believed, however, by leading Unitarians that the indications are favorable for a revival and new growth of this church, there being scattered believers in this form of Christianity throughout the State. The Unitarians avoid formulated creeds of faith, the church in Atlanta being founded on the following bond of union :

“We whose names are written below unite to form the Church of Our Father in Atlanta, Ga.

“We agree to maintain the worship of God ; to cultivate in ourselves and in one another virtuous affections and habits, and to endeavor to pass our lives in harmony with the Spirit and Life of Jesus Christ.”

BENEVOLENT AND CHARITABLE INSTITUTIONS.

GEORGIA LUNATIC ASYLUM.—Mr. Iverson L. Harris, of Baldwin on the 28th of November, 1837, reported a bill in the Senate of Georgia to erect a Lunatic Asylum and appropriate money for that purpose. First appropriation was made in 1837, for purchasing site and commencing work, \$20,000.

Sum total appropriated from 1837 to 1884 for building, improvements, purchase of land, \$848,223.53.

The institution was opened for the reception of patients October 12, 1842.

The first Superintendent and Resident Physician was Dr. David Cooper.

The second, Dr. Thomas F. Green, from January 1, 1846, to the date of his death, February 13, 1879.

The third, Dr. T. O. Powell, from February 13, 1879, and is the present Superintendent and Resident Physician.

Dr. T. O. Powell has, however, been connected with the institution for the last twenty-three years.

The Asylum is located two miles south of Milledgeville.

Number of acres of land owned, 3,064.

The present number of patients is 1,240.

The cost per capita, per diem, including everything, except building purposes, is from thirty-four to thirty-five cents.

The per cent. of recovery bears a direct ratio to the duration of insanity; recent cases that have not been insane longer than from four to six months, a very large per cent. recover, but cases that have been insane for twelve months or more, very few recover.

Of the 1,240 patients, 350 are colored.

The buildings for the colored insane are detached and some distance from the buildings for the white insane.

There are two buildings in progress of completion for white insane, which will accommodate about 250 more patients. When these buildings are done there will be in all nine buildings, which will accommodate 1,450 patients. They are substantial brick buildings, three stories high, and built far enough apart, in case of fire in any one, not to endanger the others.

THE GEORGIA ACADEMY FOR THE BLIND.—This institution was incorporated by Act of the Legislature of January 2d, 1852. It originated in a movement made by the citizens of Macon at a meeting for this purpose on April 15th, 1851. In January following, it was chartered, and 7 eminent men named as Trustees. The Act required them to "select the indigent blind of the State between the ages of 12 and 20 years, and maintain and educate them gratuitously," and appropriated \$5,000 per annum for the years 1852 and 1853 to aid in supporting the institution. The school was opened in July, 1851. Mr. W. S. Fortescue was the first Principal, and Miss Hannah Guilan the female teacher.

On February 18th, 1854, the Legislature appropriated \$10,000 to erect a suitable building. Further appropriations were afterward made and the building completed in 1860. Its total cost is about \$65,000.

This year (1876) there are 56 pupils in the Academy. Since its opening, 145 have been admitted; of these, 75 have been discharged as educated in one or more of the departments—many of them with trades by which they can earn their support.

Pupils are now admitted between the ages of 8 and 20; but males over 20 are taken into the workshop to learn trades.

The appropriation for 1876 for supporting the institution was \$13,000—about an average of the yearly appropriations.

The value of the buildings, grounds and property is \$75,000. There are about 1,000 volumes in the library, including those in embossed print.

The present Principal of the Academy, Rev. W. D. Williams, was elected to his position in August, 1858.

Miss Hannah Guillan, the first instructress, still occupies the same post. Hon. James Mercer Green, the President of the Board of Trustees from the beginning, deserves honor for his faithful discharge of duty. He is one of Georgia's best citizens.

In 1882 a department for the colored blind was opened, and is doing a good work for this class.

The State has appropriated, first and last, for grounds and improvements:

| | |
|-----------------------------|----------|
| For White Department..... | \$70,000 |
| For Colored Department..... | 14,000 |
| | <hr/> |
| | \$84,000 |

The present Board of Trustees and officers are as follows: Lewis N. Whittle, President; H. L. Jewett, Treasurer; Virgil Powers, T. G. Holt, Ben. C. Smith, H. J. Lamar, and J. M. Jones.

THE GEORGIA INSTITUTION FOR THE EDUCATION OF THE DEAF AND DUMB.—At the session of the Legislature in 1833, Mr. John J. Flournoy presented a memorial praying the establishment of such an institution. By request of the Legislature, the Governor (Hon. Wilson Lumpkin), at the next session, laid all the information he had procured on the subject before that body. Whereupon the Legislature appropriated \$3,000 for the education of the "Deaf and Dumb" of Georgia, at the Asylum at Hartford, Connecticut. The experiment proving unsatisfactory on account of the great distance and the unwillingness of subjects to go so far from home and among strangers, in 1845 the Legislature required all the State's beneficiaries to be withdrawn from Hartford, and educated in Georgia. Rev. Jesse H. Campbell, who was then State Commissioner, made an arrangement with the Hearn Manual Labor School, at Cave Spring, Floyd county, to make the education of deaf mutes a department of the school. Mr. O. P. Fannin, then associate teacher

in that school, was sent to Hartford in order to learn the method of teaching, whence he brought back the Georgia pupils and entered them in the deaf mute department of the Hearn School. He opened in a log cabin, May 15, 1846, with four pupils.

In 1847, the Legislature made an appropriation for erecting a suitable building, locating the institution at Cave Spring. The building was completed in June, 1849, and was occupied July 1 following.

From this time until March, 1862, there was no break in the operations of the school. But the turbulence of the times and the enlistment of two of the teachers in the army decided the trustees to close the doors of the institution.

At the session of 1866, the Legislature made an appropriation for re-opening the school, and it was accordingly thrown open in February, 1867, and from that time to the present there has been no interruption in the exercises. In 1876, the Legislature authorized and provided for the erecting of a suitable building for the admission of negro pupils, and since its completion the colored deaf mutes have enjoyed equal facilities for instruction with the whites, under the immediate care of teachers of their own race.

All deaf mutes of the State who are over ten and under twenty-seven years of age, mentally and physically sound, free from any immoral habits or contagious disease, are entitled to all the benefits of the institution, *free of charge*, for the term of six years. Deaf mutes from other States are admitted upon payment of \$175 each per school term of ten months.

The annual appropriation for the support of the institution is \$15,000, and the number at present receiving instruction is fifty-three whites and thirty-one colored; total eighty-four.

The present principal is Professor W. O. Connor.

ORPHANS' HOME OF THE NORTH GEORGIA CONFERENCE.—This institution was established by the North Georgia Conference, M. E. Church, South, in 1867. The venerable Jesse Boring, M. D., D. D., still an active member of the Conference, originated the plan, and it was established mainly by his efforts. The Home is located about half mile from the railroad depot, in the town of

Decatur, DeKalb county, where it has a comfortable new home of eight rooms and a farm of three hundred acres, which is partly in cultivation. None but full orphans are admitted, except in extreme cases, and parties previously in charge must formally surrender all control of candidates for admission to the Home authorities.

The Home has no endowment, but is entirely dependent on voluntary contributions from the people. An average of about sixty otherwise homeless children are well cared for, properly trained in mind and morals, and fitted to fill honest and honorable vocations in life.

Rev. A. J. Gibson is Superintendent and Agent, assisted by his wife, and resides at the Home.

ORPHANS' HOME, SOUTH GEORGIA CONFERENCE.—This is located in Bibb county, near Macon. It was first founded by Mr. Maxwell, of Macon, as a private benevolent enterprise of his own, in 1857, and so continued until 1873, when it passed into the hands of the South Georgia Conference, M. E. Church, South.

From the beginning till now, 548 orphans have been received—510 of them since it became the property of the Conference—the present number being 62.

The Home has 90 acres of land and the property is worth \$8,000 and out of debt. The children are taught in the elementary branches, and are brought up in the practice of farm and household work, and are kept till good homes can be secured for them. Rev. L. B. Payne is the Superintendent.

THE SAVANNAH FEMALE ASYLUM

Was founded in Savannah in 1801. It has been supported by annual subscriptions and has received many valuable bequests. The affairs of the institution are conducted by a board of directresses who meet once a month, and a visiting committee is appointed to purchase the necessary food, such as groceries, also clothes. The house is conducted by a matron, second matron and cook, also a teacher, who is non-resident of the asylum. The number of orphans now in the asylum is fifty-six. Children are re-

ceived from the age of three years, and are bound until they reach the age of eighteen years to the asylum. A butcher sends his cart daily to the asylum, also the baker. The health of the children is excellent.

THE GEORGIA STATE AGRICULTURAL SOCIETY.

Hon. Mark A. Cooper, late of Bartow county, was the first to suggest the formation of such an organization, and a general plan or method of proceeding to insure success. As the result of his suggestion, early in the summer of 1846, there appeared in the newspapers of the State a call, signed by forty-four prominent men, for an "Agricultural Fair and Internal Improvement Jubilee" at Stone Mountain, in DeKalb county, eighteen miles from Atlanta. Three of these signers have been Governors of the State, George W. Crawford, Charles J. McDonald, and Wilson Lumpkin. In the call they express the belief that great good may result to the planting interest of Georgia, Alabama, Carolina, and Tennessee, from a personal interchange of the results of their experience, accompanied with an exhibition of the products of their farms, and suggest the "propriety of those engaged in agricultural pursuits, and such others as may feel an interest in the subject, meeting at some central point in the up country for that purpose." They named "Stone Mountain as the place most suitable," and fixed the time near the 1st of August, because by that time "the several railroads in Georgia will be finished, at least from Oostanaula to the seaboard."

The meeting assembled August 7, 1846. Mark A. Cooper was chairman, and David W. Lewis, of Hancock, was Secretary.

They formed a Society for "developing and illustrating the resources of the country," and fifty-one gentlemen subscribed their names as members, paying the membership fee of \$1.00 each. They then elected permanent officers as follows:

Hon. Thomas Stocks, of Greene, President; David W. Lewis, of Hancock, Secretary; and Wm. M. D'Antignac, of Richmond, Treasurer. The Society then resolved to hold a fair annually "for the exhibition of and sale of all such products of agriculture and

horticulture as may be contributed by members and citizens, . . . to include animal and vegetable products of plantations, farms, orchards, gardens and dairies, agricultural implements and articles of domestic manufacture, useful to the planter and farmer."

Such was the beginning of the Society which has become famous and useful in the State and the whole country.

Fairs were held at Stone Mountain in 1847, '48 and '49; at Atlanta in 1850, and at Macon in 1851.

When first organized the Society was called "The Southern Central Agricultural Society," the aim being to include the people of the adjoining states, and it was chartered by that name February 17th, 1854.

In December, 1860, its name was changed to that of the "Georgia State Agricultural Society," and a new charter was obtained, in which the sum of \$2,500 per annum was appropriated to the Society from the State Treasury.

During the war, its operations were suspended, but in 1868 it was reorganized, and a fair held at Macon in 1869, and continuously every year since, excepting 1876, on account of the Centennial Exhibition, and the years 1881 and 1882, by reason of the International Cotton Exposition, which was held at Atlanta, in 1881.

The Society is a representative body, composed of prominent and intelligent men elected annually by local organizations. It has also a number of life members, and justly exerts a large influence in the State. Through its earnest recommendation, the State Agricultural Department and the Geological survey were organized in 1874, and it had much to do with the passage of a law for the inspection and analysis of fertilizers.

The exhibitions at its annual fairs are alwas superior, and well attended, not only by the people of Georgia, but by those of the states, North and South.

The essays and addresses delivered at its semi-annual conventions are not excelled in ability, learning, instructiveness and practical usefulness by those of any similar association in the United States, and are truly occasions of very great interest.

The Spring Convention is held annually on the second Tuesday in February, in the southern part of the State, and the Summer Convention in August, in the northern part of the State.

The Presidents of the Society have been as follows:

Hon. Thomas Stocks, 1846 to 1854; Hon. Mark A. Cooper, 1854 to 1856; Dr. L. B. Mercer, 1856 to 1858; Hon. D. W. Lewis, 1858 to 1860, and was President up to the time of its re-organization in 1868; Col. B. C. Yancey, 1868 to 1871; Senator A. H. Colquitt, 1871 to 1876; Hon. Thomas Hardeman, 1876 to 1884; Hon. L. F. Livingston from 1884 to (incumbent).

The office of Secretary is at present filled by Col. E. C. Grier, and is located at Macon.

CHAPTER IV.

RAILROADS, BANKS AND NEWSPAPERS.

RAILROADS.

The position occupied by Georgia makes it the natural highway of commerce from the great Northwest to the South Atlantic seaboard, as well as for the inter-traffic of the South Atlantic and Gulf States of the Union. The Appalachian chain of mountains, which find their fullest development and oppose the greatest obstacles to the engineers' skill, in Virginia, North Carolina, Kentucky, Tennessee and Northeast Georgia, sink into comparatively insignificant hills and occasional isolated peaks before reaching the middle meridian line of the State. This subsidence of the mountain affords the first broad gateway of easy, practical railway communication between the upper and middle Mississippi Valley and the South Atlantic seaports, south of Maryland. The near approach to each other of the upper affluents of the Altamaha and Tennessee rivers, and the intervening Etowah and Chattahoochee rivers, early suggested the practicability of connecting the waters of the Mississippi with those of the Atlantic ocean, at Brunswick, Georgia, by a great canal. Meanwhile, the lessened cost of railway construction and equipment has had the effect to postpone the enterprise. But the route has been surveyed and its practicability demonstrated.

The railway system of Georgia forms radiating centers at Atlanta and Macon, two interior cities, and Savannah, Augusta and Columbus, on the borders of the State, and would seem to be as nearly perfect as could be desired, meeting, as it does, the demands of all sections. There are now in operation within the State limits about 3,200 miles of railways, and other lines are being projected and built.

THE RAILROAD COMMISSION.

On the 14th of October, 1879, the General Assembly of the State, in pursuance of authority vested in them by the Constitution of 1877, passed a bill establishing a Railroad Commission. The act provides for the appointment by the Governor, with the approval of the Senate, of three Commissioners, "of whom one shall be of experience in the law, and one of experience in railway business," each to serve for the term of six years, at a salary of \$2,200 per annum. It also prohibits unjust discrimination and extortion and provides remedies in the hands of the Commission for violation.

It makes it the duty of the Commission to "make reasonable and just rates of freight and passenger tariffs" and "reasonable and just rules and regulations," to be observed by all railroad companies doing business in this State. It prohibits any rebate or *bonus*, directly or indirectly, for the purpose of misleading or deceiving the public in any way as to real charges for freight and passengers. In fact, the law vests a very large power and discretion in the Commission over the whole business of railway transportation in the State. Of course the bill met with determined opposition on the part of those who believed that the operation of such a law would inevitably cripple the then existing railroads, and retard, if not prevent, any further development. While the policy of the Legislature was popular among the masses, there were many who took a gloomy view of the future of railroad enterprise in Georgia.

The Governor appointed as Commissioners, Ex Governor James M. Smith, whose reputation as an able and successful lawyer is not excelled in the State; Maj. Campbell Wallace, of long and successful experience in practical railroad management, and Samuel Barnett, Esq., also a fine lawyer, and of most discriminating judgment. The Commission organized by electing Gov. Smith to be Chairman and Maj. R. A. Bacon as Secretary, and immediately applied themselves to the onerous duties prescribed. The wisdom of the appointment of the Commission was soon illustrated by the character of the work done by them. Without entering into any discussion of the wisdom and propriety of the organic law of the Commission, in the abstract, it is

evident that the result has been salutary, and in a high degree beneficial to the general public. There are complaints on the part of some of the railroads that the rates imposed by the Commission do not permit them to realize just and reasonable dividends. It is probable that unintentional injustice has resulted in some instances.

Indeed, it would be a miracle if such instances did not occur in the early years of an untried experiment. The Commission, however, has exhibited a just and generous spirit, and a cheerful readiness to correct mistakes and repair injuries, which have left little ground for complaint on the part of the railroad corporations of the State. Moreover, tried by the effect of their rates and rulings on the further development of railroad enterprises, it cannot be shown that the establishment of the Commission has thrown a damper on the work of developing the State by the construction of new lines of railroad, or the improvement and perfect equipment of old established lines.

The rates established by the Commission compare very favorably with those which are of force in other States where there is no restriction, except the effect of ordinary competition, and in some instances they are even more favorable and liberal to the roads.

AMERICUS, PRESTON AND LUMPKIN RAILROAD. This is a narrow gauge railroad, now in course of construction, from Americus, on Central Railroad, to Lumpkin—via Preston, 38 miles. When completed it will furnish transportation to one of the best farming sections of the State. S. H. Hawkins, President, Americus, Ga.

ATLANTA AND WEST POINT RAILROAD.—This road runs by its own line from East Point to West Point, both within the State, and is 80.74 miles in length. According to original contract the Company use the track of the Central Railroad between Atlanta and East Point, a distance of 6.5 miles, thus connecting Atlanta and West Point and making a total distance of 87.24. It also controls and operates the lines of road from West Point to Montgomery, and from Columbus to Opilika. This road was chartered by the State in 1847 and was completed to West Point in 1857. A little more than one-third of the stock of this company is held by the Georgia Railroad Company, which in turn is under lease to the Central Railroad of Georgia ($\frac{1}{2}$) and others.

The Atlanta and West Point Railroad is well constructed and equipped and is admirably managed. The country through which

it passes is not excelled in the State for fertility of soil, intelligence of the people and density of population.

President, L. P. Grant, Atlanta, Ga.

BRUNSWICK AND WESTERN RAILROAD runs from Brunswick to Albany, 171 miles. This company is a re-organization of the Brunswick and Albany Railroad Company, the latter being the successors of the Brunswick and Florida Railroad Company, which was sold October 15, 1873, under foreclosure, for failure to pay the interest on its mortgaged bonds. The road is now owned and operated by the Savannah, Florida and Western, and forms a part of "the Plant System," which includes some of the principal railroads in Florida.

President, Fred. Wolffe, 35 William Street, New York.

BUENA VISTA RAILROAD.—This road connects Buena Vista, in Marion county, with Andersonville, on the Southwestern (Central Railroad), 28 miles, and was built and completed in 1884. It passes through a beautiful and productive country, embracing portions of Sumter, Schley and Marion counties. The road-bed was graded and crossties laid—ready for the iron—by the almost unaided efforts of the citizens along its course. The Central Railroad Company furnished and laid the iron and supplied the rolling stock.

President, — C. B. Lowe, Buena Vista, Ga.

CENTRAL RAILROAD OF GEORGIA.—This company was chartered in 1833 as the Central Railroad Company and originally embraced the line from Savannah to Macon, 192 miles. This main track was completed in 1843, and shortly afterward the company constructed the branch from Gordon to Milledgeville, 17.25 miles. In 1852, the company leased the Eatonton Branch Road, just completed from Milledgeville to Eatonton, 22 miles, virtually making, with the Gordon and Milledgeville Branch, a branch from Gordon to Eatonton, 39.25 miles. In 1862, they leased the Augusta and Savannah Railroad, from Augusta to Millen, on the old Central line, 53 miles. In 1871, the company leased the Southwestern Railroad and branches, as follows: Main line, Macon to Albany, 104 miles; Fort Valley to Columbus, 71 miles; Fort Valley to Perry, 11 miles; Smithville to Eufaula, Alabama, 61 miles; Cuthbert to Fort Gaines, 22 miles; Albany to Arlington, 37 miles, making a total of 306 miles.

In 1872, the Macon and Western Railroad, from Macon to Atlanta, 103 miles, was consolidated with the Central Railroad, and the name of the consolidated company changed to "The Central Railroad

Company of Georgia." In 1876, the Savannah, Griffin and North Alabama Railroad, extending from Griffin, on the old Macon and Western, to Carrollton, a distance of 59.29 miles, passed under the control of the Central as chief holders of its stock and bonds. At various times, the Central has acquired a more or less controlling interest in several lines, mostly in the adjoining States of South Carolina and Georgia. It owns a one-half interest in the Georgia Railroad lease, and more than one-third interest in the Atlanta and West Point Railroad.

The system may be summed up as follows:

I. Lines Owned:

| | |
|---------------------------------------------------------|---------------|
| <i>Main Line</i> : Savannah to Macon,..... | 192 |
| <i>Atlanta Division</i> : Macon to Atlanta,..... | 103 |
| <i>Milledgeville Br.</i> : Gordon to Milledgeville..... | 17—312 miles. |

II. Lines Leased:

| | |
|----------------------------------------------|----------------|
| <i>Augusta and Savannah R. R.</i> | 53 |
| <i>Eatonton Branch R. R.</i> | 22 |
| <i>Southwestern R. R. and Branches</i> | 321—396 miles. |

Total owned and leased in Georgia,.....708 miles.

The above includes only the parts of the system owned or controlled as sole lessees by the Central Company.

III. Lines operated by separate companies. Net results due to the Central R. R.:

| | |
|-----------------------------------------------------|--------------|
| <i>Montgomery and Eufaula R. R.</i> | 81 |
| <i>Columbus Branch, Western R. R. of Ala.</i> | 29 |
| <i>Columbus and Western R. R.</i> | 60—170 miles |

Total Central system proper..... 878 miles.

In addition to these lines, the Central owns the Ocean Steamship Company of Savannah, which runs five steamers between Savannah and New York in connection with Central Railroad system.

The Central is one of the best organized companies in Georgia, and has the merit of being largely owned and controlled by citizens of the State.

President, William G. Raoul, Savannah, Ga.

COLUMBUS AND ROME RAILWAY.—This is a narrow gauge (three feet) road, and was originally chartered as the North and South

Railroad, and under that name opened in 1877 from Columbus, 23 miles.

The road then changed hands, and as the Columbus and Rome Railroad was extended to Hood in 1880. July 1, 1881, the present company purchased the road and extended it to Chipley, and in 1884 to Greenville, in all 45 miles. John Peabody is President, at Columbus, Ga.

EAST TENNESSEE, VIRGINIA AND GEORGIA RAILROAD.—This company was formed by a consolidation, November 20, 1869, of the East Tennessee and Virginia Railroad, completed in 1855, and the East Tennessee and Georgia Railroad opened in 1856. On June 14, 1881, the company bought the Selma, Rome and Dalton Railroad, from Selma, Ala., to the Georgia State line, having previously acquired the Georgia Southern Railroad, from the State line to Dalton, Georgia. In 1881 the Macon and Brunswick Railroad, from Macon to Brunswick, was purchased from the State of Georgia and added to the system. About the same time the company bought the road then building from Rome to Macon *via* Atlanta, and soon completed the same.

The E. T., Va. & Ga. Railroad is the most extensive system of roads in operation in the Southern States.

The following table shows the different ramifications of its lines :

Line of Road.

| | |
|-------------------------------------------|--------|
| Bristol, Tenn., to Chattanooga, Tenn..... | 242.00 |
|-------------------------------------------|--------|

Alabama Division.

| | |
|--------------------------------------------|--------|
| Cleveland, Tenn., to Lauderdale, Miss..... | 359.00 |
|--------------------------------------------|--------|

| | |
|-------------------------------------------|-------|
| Lauderdale, Miss., to Meridian, Miss..... | 18.00 |
|-------------------------------------------|-------|

| | |
|-------|--------|
| ————— | 377.00 |
|-------|--------|

Atlanta Division.

| | |
|------------------------------|--------|
| Rome, Ga., to Macon Ga. | 158.60 |
|------------------------------|--------|

Brunswick Division.

| | |
|-----------------------------------|--------|
| Macon, Ga., to Brunswick, Ga..... | 190.00 |
|-----------------------------------|--------|

Branches.

| | |
|----------------------------------------|--------------|
| Morristown, N. C., to Unaka, Tenn..... | 43.30 |
| Ooltewah, Tenn., to Red Clay, Ga..... | 11.50 |
| Cochran, Ga., to Hawkinsville, Ga..... | 10.00 |
| Knoxville, Tenn., to Jellico, Ky..... | 65.50-130.30 |
| | <hr/> |
| | 1,097.90 |

This road antagonizes (in Georgia) the Central Railroad and the Western and Atlantic Railroad, its main lines being nearly parallel from Cleveland, Tenn., to Macon, Ga., to those of the two latter. It does a very large business in shipping lumber and turpentine products to the Northwest and to the port of Brunswick.

The road is now in the hands of Henry Fink, Receiver, appointed by the U. S. District Court.

Receiver, Henry Fink, Knoxville, Tennessee.

ELBERTON AIR-LINE RAILROAD, a narrow gauge road (three feet), was chartered in December, 1871, completed in December, 1878, and connects Elberton and Toccoa, 50 miles. This road is a dependent of the Atlanta and Charlotte Air-Line Railway, and with it is operated, under lease, by the Richmond and Danville Railroad Company.

President, John H. Jones, Elberton, Ga.

ETOWAH AND DEATONS RAILROAD.—This is strictly a private line, operated for private purposes only, and runs from Seney to Deatons, 9 miles.

GAINESVILLE AND DAHLONEGA RAILROAD.—Chartered in 1886 and is being very slowly constructed from Gainesville to Dahlonega, in the heart of the gold mining district of the State, a distance of 26 miles. It is a three-foot gauge.

President, Wm. P. Price, Dahlonega, Ga.

GEORGIA RAILROAD (AND BANKING Co.)—Main line from Augusta to Atlanta, 171 miles; branches, Camak, on main line, to Macon, 78 miles; Union Point to Athens, 40 miles; Barnett to Washington, 18 miles; total, 307 miles.

The Georgia Railroad Company was chartered December 21, 1833, and completed in 1845, except the branch from Camak to Macon,

which was chartered in 1859, completed in 1872, and became consolidated with the present company, by purchase, the same year.

On the first day of April, 1881, the Georgia Railroad and its dependencies was leased to Wm. M. Wadley, then President of the Central Railroad system, at an annual rental of \$600,000. During the same year, Mr. Wadley acquired control of the Gainesville, Jefferson and Southern Railroad, from Gainesville to Monroe, 42 miles, and from Florence to Jefferson, 13 miles. He also soon gained control of the Walton County Railroad, the connecting line from Monroe to Social Circle, 10 miles, and the two roads were consolidated and opened from Social Circle to Gainesville, March 11, 1884.

The management of the Georgia Railroad has always been in able hands, and the history of the road is a series of successes and liberal dividends. Most of the stockholders are citizens of the State.

President, C. H. Phinzy, Augusta, Georgia.

GEORGIA PACIFIC RAILWAY.—This road is intended to connect Atlanta with Columbus, Mississippi, and is still in course of construction. The company procured a charter December 31, 1881, and the line was opened for business from Atlanta, Ga., to Anniston, Ala., 103 miles, in March, 1883; to Birmingham, Ala., 167 miles, November 18, 1883; and since then to Coalburg, Ala., 177 miles.

President, John W. Johnson, Birmingham, Ala.

HARTWELL RAILROAD is a three-foot gauge, and connects Hartwell with Bowersville, on Elberton Air-Line Railroad, 10 miles. It was built in 1879.

President, G. J. Foreacre, Atlanta, Ga.

LAWRENCEVILLE BRANCH RAILROAD.—This road connects Lawrenceville with Suwanee, on the Richmond and Danville Railway, a distance of only 10 miles, and was opened April 1, 1881. It is a narrow gauge.

President, T. M. Peeples, Lawrenceville, Ga.

LOUISVILLE AND WADLEY RAILROAD, from Louisville to Wadley, on Central Railroad, 10 miles. Opened in 1879.

President, William Donovan, Wadley, Ga.

MARIETTA AND NORTH GEORGIA RAILROAD.—This road is intended to connect Marietta, Ga., with Murphy, N. C., a distance of 110 miles. The gauge is three feet. It was completed to Canton, 24 miles, May 1, 1879, and to Ellijay, 60 miles, in the fall of 1884.

This road runs through some of the most extensive marble beds in this country, and penetrates a section that has heretofore been almost entirely cut off from the markets of the world.

President, James Kinsey, Cincinnati, O.

NORTHEASTERN RAILROAD OF GEORGIA connects Athens with Lula, on the Richmond and Danville Railroad, forty miles, and Rabun Gap Junction, on the latter road, with Tallulah, 20.8 miles, using the intervening track of the Richmond and Danville between Lula and Rabun Gap Junction, 11.2 miles. The company was chartered October 17, 1870, and opened September 1, 1876. The road is now under control of the Richmond and Danville system.

President, Pope Barrow, Athens, Ga.

ROME RAILROAD.—Connects Kingston with Rome, a distance of 20 miles. Chartered in 1837, and opened for business in December, 1848.

President, Eben Hillyer, Rome, Ga.

ROSWELL RAILROAD.—Roswell to Roswell Junction, 10 miles; three-feet gauge.

President, J. W. Robertson, Roswell.

SANDERSVILLE AND TENNILLE RAILROAD.—Connects Tennille, on Central Railroad, with Sandersville, 3 miles. Chartered March 4, 1875.; opened October 31, 1876.

President, C. R. Pringle, Sandersville, Ga.

SAVANNAH, FLORIDA AND WESTERN RAILWAY.—The first section of this road, from Savannah to Scriven (opened in 1858), 69 miles, was built by the Savannah, Albany and Gulf Railroad Company. The second, from Scriven to Bainbridge, 167 miles (completed in 1867), was constructed by the Atlantic and Gulf Railroad Company. These companies were consolidated, in 1865, under the latter name. In 1869, the Albany Branch was purchased, and soon extended to completion. In 1877, the road went into the hands of receivers and in 1879 was sold to the present company. In 1884, arrangements were perfected which effected a consolidation of several other important lines, chiefly in Florida, making the total length of the lines 480 miles.

President, H. B. Plant, 12 W. 23d St., New York.

SAVANNAH, GRIFFIN AND NORTH ALABAMA RAILROAD.—This road was opened from Griffin to Carrollton in 1872, 59.29 miles, but pass-

ed into the control of the Central Railroad in 1876, and is now operated by the latter company.

President, W. G. Raoul, Savannah, Ga.

TALBOTTON RAILROAD, from Talbotton to Bostwick, on Central Railroad, seven miles; opened May 4, 1881; President S. W. Thornton, Talbotton, Ga.

WESTERN AND ATLANTIC RAILROAD.—This road, so long popularly known as the "State Road," because built by the State of Georgia, was completed and opened in the year 1850. It connects Chattanooga, Tennessee, with Atlanta, 138 miles. In 1870, by act of the General Assembly, the road and all its franchises were leased to a private company for a term of twenty years, at an annual rental of \$300,000, which is paid monthly. Under the direct management of the State this important interest was made an almost constant bone of contention between opposing parties, and its hundreds of offices were generally bestowed as rewards for partisan work. Under the able business administration of Governor Brown, a very considerable revenue was derived from it. Under the lease, which has yet five years to run, the income to the treasury, though moderate, has enabled the State to make appropriations for the maintenance of the public school system, without resorting to direct taxation. It is believed that this road would sell for nearly enough to liquidate the public debt of the State. President, Joseph E. Brown, Atlanta.

BANKS.

There are in the State twenty-two banking institutions operating under State charters. These have no circulation, and confine their operations to discounts and deposits. Their capital stock amounts to \$4,142,000; reserve, \$1,392,000; total available capital \$5,534,000. In addition, there are quite a number of private bankers, operating without charters, but affording the same facilities, according to capital, as are furnished by regular chartered institutions.

Under the national banking law, there are fifteen national banks in the State, representing an aggregate paid up capital stock of \$4,436,000, and a reserve of \$691,000.

RECAPITULATION.

| | Capital Stock. | Reserve. | Total. |
|---------------------|----------------|-------------|-------------|
| State Banks..... | \$4,142,000 | \$1,392,000 | \$5,534,000 |
| National Banks..... | 2,436,000 | 691,000 | 3,127,000 |
| | <hr/> | <hr/> | <hr/> |
| | \$6,578,000 | \$2,083,000 | \$8,661,000 |

In addition to the above facilities, the Central Railroad and Banking Company and the Georgia Railroad and Banking Company, according to authority granted in their respective charters, each do a large banking business at Savannah and Augusta, respectively, and at agencies at several points.

The following is a list of the State and National banks, the latter being sufficiently indicated by the occurrence of the word "National." The list also includes some of the more prominent private banking institutions :

List of State and National Banks in Georgia.

| CITY OR TOWN. | Name of Bank. | President. | Cashier. | Paid up Capital. | Surplus. |
|-------------------|----------------------------------------|-----------------------|--------------------------------|------------------|-----------|
| | | | | \$ | \$ |
| Albany..... | Lewis Bros..... | (Private Bankers) | ..... | 50,000 | 10,000 |
| Americus..... | Bank of Americus..... | M. Speer..... | John Windsor..... | 150,000 | 60,000 |
| "..... | People's National Bank..... | S. H. Hawkins..... | H. C. Bagby..... | 50,000 | 5,000 |
| "..... | Georgia Loan and Trust Co..... | ..... | O. A. Coleman, Sec. & Tr. | 35,000 | ..... |
| Athens..... | Bank of the University..... | M. Stanley..... | A. P. Dearing..... | 125,000 | 6,000 |
| "..... | National Bank of Athens..... | A. K. Childs..... | James White..... | 100,000 | 100,000 |
| Atlanta..... | Atlantic National Bank..... | James Swann..... | Paul Romare..... | 150,000 | 50,000 |
| "..... | Bank of the State of Georgia..... | F. M. Coker..... | F. M. Coker, Jr..... | 100,000 | 65,000 |
| "..... | Gate City National Bank..... | Ladownik J. Hill..... | E. S. McCandless..... | 250,000 | 70,000 |
| "..... | Merchants' Bank..... | J. H. Porter..... | R. M. Farrar..... | 200,000 | 50,000 |
| "..... | Maddox, Rucker & Co..... | (Private Bankers) | ..... | ..... | ..... |
| Augusta..... | Augusta Savings Bank..... | Alfred Baker..... | Joseph S. Bean..... | 30,000 | 50,000 |
| "..... | Commercial Bank..... | John A. North..... | L. T. Taliaferro..... | 300,000 | 20,000 |
| "..... | Georgia Railroad and Banking Co..... | Chas. H. Plumizy..... | Charles G. Goodrich..... | 4,200,000 | 1,096 571 |
| "..... | National Bank of Augusta..... | Z. McCord..... | A. C. Beane..... | 500,000 | 100,000 |
| "..... | National Exchange Bank..... | Alfred Baker..... | Charles E. Coffin..... | 250,000 | 37,000 |
| "..... | Planters' Loan and Savings Bank..... | Thos. W. Coskery..... | J. T. Newberry..... | 100,000 | ..... |
| "..... | Branch's Son & Co..... | (Private Bankers) | ..... | ..... | ..... |
| Barnesville..... | Barnesville Savings Bank..... | R. J. Powell..... | A. M. Lamdin..... | 52 600 | 6,000 |
| Brunswick..... | First National Bank..... | C. Downing, Jr..... | James Herr Smith..... | 35,000 | ..... |
| "..... | J. M. Dexter..... | (Private Banker) | W. J. Way..... | 20,000 | ..... |
| "..... | J. M. Madden..... | (Private Banker) | Wm. P. Milner..... | ..... | ..... |
| Columbus..... | Chattahoochee National Bank..... | H. H. Epping..... | R. M. Munford..... | 100,000 | 50,000 |
| "..... | Eagle and Phenix Savings Bank..... | W. H. Young..... | G. Grundy Jordan..... | 1,250,000 | 650,000 |
| "..... | Merchants' and Mechanics' Bank..... | W. H. Brannon..... | A. O. Blackmar..... | 150,000 | 56,800 |
| "..... | National Bank of Columbus..... | J. Rhodes Browne..... | Geo. W. Dillingham..... | 100,000 | 50,000 |
| Dalton..... | C. L. Hardwick & Co..... | (Private Bankers) | ..... | 100,000 | ..... |
| Dawson..... | J. B. Perry..... | (Private Banker) | J. R. Mercer..... | 150,000 | 35,000 |
| Forsyth..... | W. H. Head..... | (Private Banker) | S. B. Head..... | 100,000 | ..... |
| Griffin..... | City National Bank..... | G. J. Drake..... | Jas. G. Rhea..... | 56,000 | 27,000 |
| "..... | Griffin Banking Co..... | M. L. Bates..... | J. P. Nichols..... | 50,000 | 20,000 |
| Hawkinsville..... | Hawkinsville Banking and Trust Co..... | T. C. Lathrop..... | J. D. Stetson..... | 50,000 | ..... |
| LaGrange..... | First National Bank..... | L. J. Render..... | J. G. Truitt..... | 50,000 | ..... |
| "..... | LaGrange Banking and Trust Co..... | A. D. Abraham..... | Geo. A. Speer..... | 100,000 | 60,000 |

| | | | | | |
|----------------|--------------------------------------|------------------------|-----------------------|----------------|--------------|
| Macon..... | Capital Bank..... | H. L. Jewett..... | N. M. Hodgkiss..... | 200,000..... | ..... |
| "..... | Central Georgia Bank..... | J. E. Jones..... | T. O. Chestney..... | 150,000..... | 25,000..... |
| "..... | Exchange Bank..... | Geo. B. Turpin..... | J. W. Cabaniss..... | 150,000..... | 20,000..... |
| "..... | First National Bank..... | I. C. Plant..... | W. W. Wigley..... | 100,000..... | 25,000..... |
| Montezuma..... | Macon Savings Bank..... | J. M. Boardman..... | H. T. Powell..... | 50,000..... | 3,000..... |
| Newnan..... | John F. Lewis & Son..... | (Private Bankers)..... | ..... | 150,000..... | ..... |
| Rome..... | First National Bank..... | William B. Berry..... | H. C. Fisher..... | 50,000..... | 40,000..... |
| Savannah..... | Central National Bank..... | Jno. H. Reynolds..... | B. I. Hughes..... | 125,000..... | 62,500..... |
| "..... | Central Railroad and Banking Co..... | Wm. G. Raoul..... | T. M. Cunningham..... | 7,500,000..... | ..... |
| "..... | Merchants National Bank..... | George L. Cape..... | Thos. Gadsden..... | 500,000..... | 100,000..... |
| "..... | Savannah Banking and Trust Co..... | D. G. Furse..... | James H. Hunt..... | 400,000..... | ..... |
| "..... | Southern Bank of Georgia..... | John Flanning..... | James Sullivan..... | 500,000..... | 300,000..... |

NEWSPAPERS AND PERIODICALS.

Of the 137 counties in Georgia, one or more newspapers are published in 107. The whole number of papers is about 200, divided according to frequency of issue as follows: Fifteen are daily; one tri-weekly; two semi-weekly; 164 weekly; two semi-monthly; fifteen monthly, and one quarterly.

The following is the list arranged according to alphabetical order of place of publication:

| Place of Publication. | Name of Paper. | Period. | Character. |
|-----------------------|--------------------------|-----------------------|---------------------|
| Acworth..... | News and Farmer..... | Weekly..... | News and political. |
| Alapaha..... | Berrien Co. News..... | "..... | " " |
| Albany..... | Medium..... | "..... | " " |
| "..... | News and Advertiser..... | Daily and Weekly.... | " " |
| Alpharetta..... | Milton Democrat..... | Weekly..... | " " |
| Americus..... | Recorder..... | Tri-W. and weekly.... | " " |
| "..... | Sumter Republican..... | Semi-W. and wee'y.... | " " |
| Athens..... | Banner-Watchman..... | Daily and weekly.... | " " |
| "..... | Chronicle..... | Weekly..... | " " |
| "..... | Record..... | "..... | " " |
| "..... | University Reporter... | "..... | College. |
| Atlanta..... | Acanthus..... | Monthly..... | Juvenile. |
| "..... | Christian Herald..... | Weekly..... | Methodist. |
| "..... | Christian Index..... | "..... | Baptist. |
| "..... | Christian Telescope..... | Monthly..... | Religious. |
| "..... | Constitution..... | Daily and weekly.... | News and political |
| "..... | Eclectic Star..... | Monthly..... | Medical. |
| "..... | Ga. Eclec. Med. Jour.... | "..... | " |
| "..... | Journal..... | Evening..... | News and political. |
| "..... | Med. and Surg. Jour.... | Monthly..... | Medical. |
| "..... | Monday Morn. Mail.... | Weekly..... | News and political. |
| "..... | National..... | "..... | " " |
| "..... | People's Cause..... | "..... | " " |
| "..... | Pilot..... | "..... | " " |
| "..... | Republican..... | "..... | " " |
| "..... | S. Cult. and D. Farm.... | Monthly..... | Agricultural. |
| "..... | S. Dental Journal..... | "..... | Dental. |
| "..... | S. Medical Record..... | "..... | Medical. |
| "..... | S. Templar..... | "..... | Temperance. |
| "..... | S. World..... | Semi-monthly..... | Industrial. |
| "..... | Sunny South..... | Weekly..... | Literary. |
| "..... | Way of Life..... | "..... | Holiness. |
| Augusta..... | Chronicle and Con'st.... | Daily and weekly.... | News and political. |
| "..... | Evening News..... | "..... | " " |
| "..... | Georgia Baptist..... | Weekly..... | Baptist. |
| "..... | People's Defence..... | "..... | News and political. |

| Place of Publication. | Name of Paper. | Period. | Character. |
|-----------------------|-------------------------|----------------------|---------------------|
| Bainbridge | Democrat..... | Weekly..... | News and political. |
| Barnesville | Gazette..... | " | " |
| " | Pike County News..... | " | " |
| Blackshear..... | News and Signal..... | " | " |
| Blakely..... | Early County News.... | " | " |
| Brunswick..... | Advertiser and Appeal | " | " |
| Buchanan..... | Haralson Banner..... | " | Local. |
| Buena Vista..... | Marion Co. Sentinel.... | " | News. |
| Butler | Gospel Messenger..... | Monthly..... | Pr. Baptist. |
| " | Herald | Weekly | News and political. |
| Calhoun | Times..... | " | " |
| Camilla..... | South Ga. Clarion..... | " | " |
| Canton..... | Cherokee Advance..... | " | " |
| Carnesville..... | Franklin Co. Register.. | " | " |
| Carrollton | Times..... | " | " |
| " | Free Press..... | " | " |
| Cartersville | American..... | " | " |
| " | Free Press..... | " | " |
| Cave Spring..... | Cong. Methodist..... | Semi-monthly | Methodist. |
| Cedartown..... | Advertiser..... | Weekly | News and political. |
| ChIPLEY..... | Leader | " | " |
| Clarkesville.. .. | Advertiser..... | " | " |
| Cochran | Messenger | " | " |
| Columbus..... | Enquirer-Sun..... | Daily and weekly.... | " |
| " | Times..... | " and semi-week'y... | " |
| Conyers..... | Georgia Farmer..... | Weekly | Agricultural. |
| " | Solid South..... | " | News and political. |
| " | Weekly..... | " | " |
| Covington | Georgia Enterprise..... | " | " |
| " | Star | " | " |
| Crawford | News-Monitor | " | " |
| Crawfordville..... | Democrat..... | " | " |
| Cumming..... | Clarion..... | " | " |
| Cuthbert..... | Appeal..... | " | " |
| " | Enterprise..... | " | " |
| Dahlonega..... | Signal | " | " |
| Dallas | Paulding New Era..... | " | " |
| Dalton | Argus | " | " |
| " | North Ga. Citizen..... | " | " |
| Danielsville..... | Monitor | " | " |
| Darien | Timber Gazette..... | " | " |
| Dawson..... | Journal | " | " |
| Dawsonville | News | " | " |
| Decatur..... | DeKalb News..... | " | " |
| Douglasville | Star | " | " |
| Dublin | Gazette | " | " |
| " | Post | " | " |
| Eastman..... | Times..... | " | " |
| East Point... .. | Plowboy..... | " | Neutral. |

| Place of Publication. | Name of Paper. | Period. | Character. |
|-----------------------|--------------------------|----------------------|---------------------|
| Eatonton | Messenger | Weekly | News and political. |
| Elberton | New South | " | " " |
| Ellijay | Courier | " | " " |
| Fairburn | C'il. Co. News Letter... | " | " " |
| Forsyth | Monroe Advertiser..... | " | " " |
| Fort Gaines..... | Tribune | " | " " |
| Fort Valley..... | Mirror and Advertiser. | " | " " |
| Franklin..... | News..... | " | " " |
| Gainesville..... | Piedmont Press..... | " | " " |
| " | Southron | " | " " |
| Gibson..... | Enterprise..... | " | " " |
| Greensboro | Ga. Home Journal..... | " | " " |
| " | Herald | " | " " |
| Greenville..... | Vindicator..... | " | " " |
| Griffin..... | News | Daily and weekly.... | " " |
| " | Sun..... | Weekly | " " |
| Hamilton..... | Journal | " | " " |
| Hartwell..... | Sun..... | " | " " |
| Hawkinsville | Dispatch..... | " | " " |
| Hinesville | Gazette | " | " " |
| Irwinton..... | Southerner and Ap'eal | " | " " |
| Jackson..... | Middle Ga. Argus..... | " | " " |
| " | News | " | " " |
| Jasper..... | Mountain Boys..... | " | " " |
| Jefferson..... | Jackson Herald..... | " | " " |
| Jesup..... | Sentinel..... | " | " " |
| Jonesboro..... | News | " | " " |
| Lafayette..... | Walker Co. News..... | " | " " |
| LaGrange..... | Reporter..... | " | " " |
| Lawrenceville | Gwinnett Herald..... | " | " " |
| Leary..... | Calhoun Courier..... | " | " " |
| Lexington | Oglethorpe Echo..... | " | " " |
| Lincolnton..... | News..... | " | " " |
| Louisville..... | News and Farmer..... | " | " " |
| Lumpkin..... | Independent | " | " " |
| McDonough | Henry Co. Weekly..... | " | " " |
| Macon..... | Dental Sem. Quar'ly.... | Quarterly | Dental. |
| " | Evening News..... | Daily..... | News and political |
| " | Kind Words..... | Monthly | Baptist. |
| " | Musical Journal..... | " | Music. |
| " | Telegraph and Mess..... | Daily and weekly.... | News and political. |
| " | Wes'n Chris. Advo..... | Weekly..... | Methodist. |
| Madison | Madisonian..... | " | News and political. |
| Marietta | Journal..... | " | " " |
| " | Phoenix Agricult'rist... | Monthly | Agricultural. |
| Maysville | North Georgia..... | Weekly | News and political. |
| Milledgeville..... | Georgia Chronicle..... | " | " " |
| " | Union and Recorder... | " | " " |
| Monroe..... | Walton News..... | " | " " |

| Place of Publication. | Name of Paper. | Period. | Character. |
|-----------------------|-------------------------|----------------------|---------------------|
| Montezuma..... | Record..... | Weekly..... | News and political. |
| Monticello..... | Jasper County News... | " | " |
| Newnan | Coweta Advertiser..... | " | " |
| " | Herald..... | " | " |
| Oxford..... | Emory Mirror..... | Monthly..... | College. |
| " | Ga. College Journal.... | " | " |
| Pearson | Coffee Co. Gazette..... | Weekly..... | News and political. |
| Perry..... | Home Journal..... | " | " |
| Quitman | Free Press..... | " | " |
| Reedsville | Enterprise..... | " | " |
| Ringgold | Catoosa Courier..... | " | " |
| Rome | Bulletin | Daily and weekly.... | " |
| " | Courier..... | " | " |
| Sandersville | Herald and Georgian... | Weekly | " |
| " | Mercury..... | " | " |
| Savannah..... | Abend Zeitung (Ger.)... | " | " |
| " | Echo (colored)..... | " | " |
| " | Ga. Familien Jour.... | " | " |
| " | Journal of Comm'rce... | " | " |
| " | Morning News..... | Daily and weekly.... | " |
| " | Mystic Brotherhood.... | Monthly..... | K. of P. |
| " | Penny Local..... | Weekly..... | Local. |
| " | Times | Daily and weekly.... | News and political. |
| Smithville..... | Enterprise | Weekly..... | Local. |
| Sparta..... | Hancock Bulletin..... | " | News and political. |
| " | Ishmaelite T. & Planter | " | " |
| Spring Place..... | North Georgia Times... | " | " |
| Statesboro | Eagle..... | " | Local. |
| Summerville..... | Gazette | " | News and political. |
| Swainsboro | Em'nuel Co. Itemizer... | " | " |
| Sylvania..... | Telephone | " | " |
| Talbotton | New Era..... | " | " |
| Thomaston | Middle Ga. Times..... | " | " |
| Thomasville | Southern Enterprise... | " | " |
| " | Times..... | " | " |
| Thomson | McDuffie Journal..... | " | " |
| Toccoa | News | " | " |
| Trenton..... | Dade County Times.... | " | " |
| Valdosta..... | Times..... | " | " |
| Vienna | Dooly Vindicator..... | " | " |
| Warrenton..... | Clipper | " | " |
| Washington | Gazette..... | " | " |
| Waycross | Reporter..... | " | " |
| Waynesboro | Burke Co. Herald..... | " | " |
| " | True Citizen..... | " | " |
| West Point..... | Enterprise | " | " |
| Wrightsville..... | Recorder | " | " |



PART III.—THE PRODUCTIONS.

CHAPTER I.

After the COUNTRY and the PEOPLE naturally come the PRODUCTIONS—the uses made of the country by the people.

These divide readily into two heads, viz—

1. WEALTH, the accumulation of past productions, and—
2. CURRENT or ANNUAL PRODUCTION.

WEALTH OF GEORGIA.

We treat of wealth first, because it enters into current production, as a most important factor. Each successive generation of men has not only nature, but wealth, as its heritage. The portion of wealth devoted to reproduction, *i. e.*, CAPITAL, has even a larger bearing (incomparably larger) on annual production than nature itself.

The aggregate wealth of the State by the census of 1880 was \$239,000,000. By the Comptroller General's Report of 1884, on the same basis it was \$295,000,000. In each sum the railroad property of the State was omitted. Including this, the aggregate for 1884 was \$317,074,271.

To show its history for several decades, the wealth was as follows for 1850, etc :

| | |
|-------------------------------|---------------|
| 1850..... | \$335,000,000 |
| 1860..... | 672,000,000 |
| 1870—Greenbacks..... | 226,000,000 |
| Gold..... | 189,000,000 |
| 1880—Including railroads..... | 251,500,000 |
| 1884—Including railroads..... | 317,000,000 |

The increase between 1850 and 1860, notwithstanding a large emigration westward was 90 per cent., almost doubling the wealth of 1850.

Losses by War—The next decade embraced the war. No returns are to be had of the years 1865-6-7. In 1868, the comparison stood thus :

| | | | |
|----------------------|-------------|----------|----------------|
| 1860—Gold..... | | | \$672,000,000 |
| 1868—Greenbacks..... | 191,000,000 | Gold.... | 130,000,000 |
| Reduction..... | | | \$ 542,000,000 |

The wealth of 1868 was not one-fifth that of 1860. At the old rate of increase the wealth of 1870 would have been \$1,227,000,000 instead of \$189,000,000 in gold.

The white population which really possessed all the wealth, numbered in 1860 not quite \$600,000; in 1870, 639,000. The reduction in wealth of the whites exceeded \$800 per capita—the amount left being less than \$300.

The French indemnity of \$1,000,000,000 levied on about 37,000,000 of people was less than \$30 a head—not one part in twenty-five of the relative loss in Georgia. This gives some idea of the stupendous losses of the war to the South.

Georgia was in 1850, the sixth State in rank as to wealth; in 1860, the eighth; in 1870, the twentieth. Along with her wealth she had lost the cream of her population. From 1868 there was a gradual advance to 1874; then a retrogression, due to the financial crisis, until 1879, and since that time a more rapid progress.

A historical table showing the wealth for successive years will be given in the Appendix.

TERRITORIAL DISTRIBUTION OF WEALTH.

By Table No. 1, in the Appendix, it will be seen that North Georgia in 1882 had a total wealth of \$44,500,000, being \$3,941 per square mile; Middle Georgia, \$91,750,000—\$7,028 per square mile; Southwest Georgia, \$42,750,000—\$2,980 per square mile; East Georgia, \$33,250,000—\$3,178 per square mile; Southeast Georgia, \$26,500,000—\$2,704 per square mile.

DISTRIBUTION ACCORDING TO FORM OF INVESTMENT.

By the census of 1880, in round numbers, the two great items were—

| | |
|----------------------------------|---------------|
| Real estate..... | \$140,000,000 |
| Personal | 100,000,000 |
| The value of farms was..... | 112,000,000 |
| Investments in manufactures..... | 20,672,000 |

BY THE COMPTROLLER GENERAL'S REPORT OF 1884.

| | |
|------------------|----------------|
| Real estate..... | \$ 174,452,761 |
| Personal | 120,432,609 |

Nearly \$70,000,000 of the real estate is city and town property.

OF THE PERSONAL PROPERTY.

| | |
|------------------------------|--------------|
| Money and solvent debts..... | \$34,230,000 |
| Bank shares..... | 5,132,000 |
| Stocks and bonds..... | 6,054,000 |
| Merchandise..... | 18,070,000 |
| Furniture..... | 11,000,000 |
| Cotton manufactures..... | 4,832,000 |
| Shipping | 1,420,000 |
| Iron works..... | 606,000 |
| Mining..... | 230,000 |

The Agricultural investment—land, live stock and tools, is \$132,000,000.

In the "Augusta Trade Review," published by the "Chronicle and Constitutionalist," of that city, the manufacturing capital of that city alone is represented at nearly \$8,000,000, and that of the State as \$38,000,000.

Evidently the tax returns do not at all correctly represent the actual manufacturing capital of the State.

WEALTH OF WHITE AND COLORED POPULATION, 1884.

| | |
|---------------|---------------|
| White | \$309,000,000 |
| Colored | 8,000,000 |

RAILROADS OF GEORGIA.

The probable value is about \$60,000,000.

The increase in the wealth of 1884 over 1883 is \$10,161,916.

The debt of Georgia in 1884, is \$8,704,635—annual interest, \$582,121.

The public property, aside from buildings, asylums, etc., consists chiefly in the ownership of the Western & Atlantic Railroad—estimated value about \$8,000,000.

The State tax on individual citizens is about \$850,000, railroad tax \$75,000, rent of W. & A. R. R. \$300,000, other sources about \$130,000 making altogether about \$1,150,000 to \$1,750,000.

The building of the State capitol may add something to the annual rate of taxation.

Georgia, as we have already seen, is eminently a *variety State* in her resources of soil, climate, and production, manufacturing facilities, mineral wealth, etc. Heretofore her chief industry has been agricultural, but other forms of employment have been developing rapidly, and her future career will probably be greatly dependent on manufacturing.

The statistics of current production are as yet more imperfect than those of realized wealth; they are more difficult to estimate, and the means of analyzing them thoroughly do not exist.

In the gradual development of the principles of census-taking, we may hope in the future for information which will enable us to give a systematic view of current production; first its synthesis—a general view of current annual production as a whole; and, second, its analysis, showing the production of its parts.

Current production goes first to the supply of current wants, and only its excess is added to annual savings. From the *gross product* must first come the *cost of material* and other elements of cost, and after the *net product* is ascertained, the *cost of living* comes out before we reach *savings*.

The analysis is not an easy one, but beginning with a tentative effort, we may clear the way for more exact estimates hereafter.

GROSS PRODUCTION.

The gross product of all industries for 1880 may be roughly estimated at \$130,000,000 to \$150,000,000, consisting of the following leading items:

| Industry. | Gross Products. |
|----------------------------------|-----------------|
| Agriculture | \$70,000,000 |
| Manufactures | 36,600,000 |
| Railroads | 15,000,000 |
| Trade | 7,000,000 |
| Professional, Gross Income | 5,000,000 |
| Labor | 5,000,000 |
| Domestic Service | 10,000,000 |

Except the first two or three, these estimates are perhaps not even approximations. In the Appendix, we may be able to make such corrections as more nearly to give probable approximations.

NET PRODUCTION.

To determine the net annual production is still more difficult, and the data more imperfect. It would be of inestimable value if in the comparison of State and National advantages and resources, we could analyze the results respectively yielded by land, capital, labor and enterprise. These pass under the names of rent, interest, wages and profits.

To state a problem well, especially in modern times, is half to solve it. We need to fill the blank in a table like the following:

FORM OF TABLE NEEDED.

For Agricultural Products.

| | |
|----------------------------------------------|---------------|
| Land—Value | \$111,000,000 |
| Rent—Estimated | 8,000,000 |
| Capital—Total | 60,000,000 |
| Fixed Capital—Stock, Tools, etc | 30,000,000 |
| Annual Capital—Total | 30,000,000 |
| Fertilizers | 5,000,000 |
| Supplies | |
| Advances | |
| Interest on Capital | 5,000,000 |
| Superintendence | |
| Labor—Wages | |
| Extras | |
| Material, Seed, etc | |
| Gross Productions | 70,000,000 |
| Deduct Material, Labor, Interest, Rent | |
| Net Profit | 25,000,000 |
| Cost of Living | |
| Savings | 8,000,000 |

These figures are only intended as suggestive, not as accurate.

A like table is needed for manufacturing and other industries. In manufacturing, the items of land and rent perhaps need not appear, but such only as the following: Capital, fixed and annual

interest, labor, superintendence, wages, advances, material, gross products, the successive reductions to ascertain net profit, expenses of living, savings.

Somewhat different items would be needed for the other great divisions of industry given in the census, as professional and personal services, and trade and transportation.

In professional services, capital is represented by previous expenditures in education, library, apparatus, etc.

In mere personal service, as that of the laborer, the domestic servant, etc., there is scarcely any capital represented. The laborer has himself and his faculties of production. The latter he exchanges for wages.

In trade, the stock in trade is capital, and bears a considerable part in production. In transportation a large capital is necessary; say, in railroad transportation, the cost of road and equipment, and a considerable annual capital also, though this may be supplied by earnings. Both trade and transportation require much labor, and so wages enter largely into their results.

With such tables complete, the comparison of National and State production would be much more easy and intelligible; and also the comparison between different forms of industry and investment.

The comparison between agricultural and manufacturing wages is usually very defective. Apparently the former suffers in the comparison; this is in appearance much more than in fact. To illustrate how this occurs, suppose the wages of a farm laborer to be \$1.00, and of an operative in a factory \$2.00; the appearance, when only the money wages are expressed, is quite to the disparagement of agriculture. But usually at the South, besides the money wages, provisions are furnished, worth, say, \$30.00 more. Again, the home of the laborer is furnished rent-free; his fuel costs nothing, and often he has a garden or a patch rent-free. In addition, he has better opportunities for a pig or two, for poultry, for milk and fruit, and on Sundays and holidays the use of a horse. There are many items of value, and many easements to the farm laborer uncounted in the usual estimates. On the other hand, out of the apparently large money income of the operative or mechanic must come expenses of rent, fuel and supplies, and all the little extras and

comforts also cost money. Again, it is to be remembered that the greater number of agricultural laborers are less skilled than mechanical workmen, and so entitled to less average wages.

On the whole, the practical choice of agriculture instead of other pursuits, shows that these differences unnoted in statistics are noted in real life, and that a large proportion of mankind prefer farming to any other occupation. It seems to be the refuge towards which many minds tend, including professional men and merchants who wish to close life in the quiet of a farm.

AGRICULTURAL PRODUCTION.

In Georgia the products of the farm are unusually varied. They may be subdivided under two great heads—*money crops* and *provision crops*. Of the money crops, cotton takes the lead, far surpassing all the others combined. There are also rice, sugar and syrup; tobacco and truck products for the market; vegetables, fruits and melons raised for sale.

Forest products and naval stores occupy also a considerable place among the industries of the State.

More varied are the *provision crops* for home use, or strictly home market. They include all the cereals, the leguminous crops, peas, beans, etc.; the root crops, all sorts of vegetables and fruits; indeed, they embrace almost everything for food of man and beast which is not tropical. So the facilities are excellent for all sorts of live stock, horses, mules and cattle, for dairy products, for poultry, etc. Food for stock can be made to cover the whole year by a judicious selection. Our comparatively short winter renders the expense of wintering stock small, and with barley or oat patches, little work is necessary in gathering food.

The following table shows the statistics of leading crops in Georgia for 1880:

▲GRICULTURAL PRODUCTS.

| | Acre. | Crop. |
|----------------------|-----------|---------------------|
| Tilled land | 7,690,292 | |
| Cotton | 2,617,138 | 814,441 Bales. |
| Corn | 2,538,733 | 23,202,618 Bushels. |
| Oats | 612,778 | 5,548,743 Bushels. |
| Wheat | 475,684 | 3,159,771 Bushels. |
| Sweet Potatoes | 61,010 | 4,397,774 Bushels. |

Of all the tilled land, it appears that 34 per cent. was in cotton, and nearly as much, say one-third, in corn. There is a growing tendency to increase the oat crop, the corn crop in much of the State being subject to summer drought.

CURRENT PRODUCTION.

It is still impossible, notwithstanding all our census returns, tax returns and other sources of information, to furnish any accurate statement of the gross annual production of any State. Estimates may be had, however, of certain departments of State industry. In 1880 the gross production of the Agricultural class in Georgia was estimated at \$67,000,000; the gross product in Georgia of manufactures was \$36,441,000. But there were other industries of which no estimates were made or even attempted. Under the denomination of Professional and Personal Services, over 100,000 people were classified, but their annual production not estimated. So, of the large number engaged in trade.

Some statistics of transportation are attainable, however. The gross receipts of the railroads of the State were probably about \$10,000,000.

The following table gives the form of information needed, with the information itself when the census furnishes it:

GROSS PRODUCTION—1880.

| | |
|-----------------------------|--------------|
| Agricultural..... | \$67,028,929 |
| Manufacturing..... | 36,440,948 |
| Trade (no estimate.) | |
| Transportation, about..... | 10,000,000 |
| Professional (no estimate.) | |
| Personal (no estimate.) | |

Passing from gross to net production, it is to be observed that the cost of material is first to be deducted and only the increment above that cost regarded as production.

The cost of material in agriculture is comparatively small. It consists chiefly of seeds and fertilizers. Probably of the \$67,000,000 gross, fully \$60,000,000 is increment on cost of material consumed. No estimates are made of the value of seed, etc., but that of fertilizers is set down at \$4,347,000.

The cost of manufacturing material exceeds the entire capital used in manufactures. Deduct from the gross product, \$36,440,948, the cost of material, \$24,143,939, and we have the increment, \$12,297,009.

The increment to value is the fund from which to pay rent, interest and wages, leaving profits.

The railroad expenses deducted from gross receipts leave as the increment, say \$2,500,000.

INCREMENT OF VALUES.

| | |
|-----------------------------|--------------|
| Agricultural..... | \$60,000,000 |
| Manufacturing..... | 12,300,000 |
| Trade (unknown.) | |
| Transportation by rail..... | 2,500,000 |
| Professional (unknown.) | |
| Personal (unknown.) | |

A rude estimate of gross product and increment might be as follows :

| | Gross | Increment. |
|---------------------|---------------|--------------|
| Agricultural..... | \$67,000,000 | \$60,000,000 |
| Manufacturing..... | 36,441,000 | 12,300,000 |
| Trade..... | 15,000,000 | 5,000,000 |
| Transportation..... | 10,000,000 | 2,500,000 |
| Professional..... | 5,000,000 | 4,500,000 |
| Personal..... | 15,000,000 | 12,000,000 |
| | <hr/> | <hr/> |
| | \$148,500,000 | \$96,300,000 |

It were very desirable, but is still quite impossible, to determine how the increment of value is distributed, into rent of land, interest on capital, wages of labor and profits of enterprise. To such completeness of information statistical science has not yet attained.

AGRICULTURAL PRODUCTION—CROPS OF GEORGIA.

Cotton is the most valuable crop. Of this great staple the production in Georgia was, in 1850, 500,000 bales; 1860, 702,000 bales; 1870, 474,000; 1880, 814,000. The largest crop ever made in the State was in 1882, 942,000.

In 1880, Mississippi alone exceeded Georgia, her crop being 963,000, and that of Texas 805,000, compared with 814,000 in Georgia, Texas, with her immense area, now leads all the cotton States.

Within the State the leading counties in cotton production are as follows by census of 1880: Burke, 29,172 bales; Washington, 23,058; Houston, 19,090; Troup, 18,055; Coweta, 16,282; Meriwether, 15,154; Hancock, 15,010; Floyd, 14,545.

In the northern tier of counties, and in the southeastern part, comparatively little cotton is produced. Fifteen or twenty counties can be named, the aggregate production of them all being less than 1,000 bales. Towns and Fannin report not one bale.

The average product of the State in 1880 was one bale to 3.21 acres.

THE CORN CROP.

On 2,538,733 acres, in 1880, the yield was 23,202,618 bushels—an average of a little over nine bushels per acre.

The crops of former census years were as follows: 1850, 30,000,000; 1861, 31,000,000; 1870, 17,500,000 bushels.

OTHER CROPS.

| | Acres. | Bushels. | Per acre |
|---------------------|---------|-----------|----------|
| Oats..... | 612,778 | 5,548,743 | 9 |
| Wheat | 475,684 | 3,159,871 | 6.6 |
| Sweet Potatoes..... | 61,010 | 4,397,774 | 72 |

The oat crop of Georgia has greatly increased since the war. The yield of different crops in former census years is given below:

| | 1850. | 1860. | 1870. |
|----------------------|-----------|-----------|-----------|
| Oats..... | 3,820,044 | 1,231,817 | 1,904,601 |
| Wheat | 1,088,534 | 2,544,913 | 2,127,017 |
| Sweet Potatoes | 6,986,428 | 6,508,541 | 2,621,562 |

There is a marked increase in wheat as well as oats, and a decrease in sweet potatoes, yet only one other State surpasses her present yield, North Carolina, with 4,576,000 bushels.

RICE.

The rice crop for successive census years has been as follows in round numbers: In 1850, 40,000,000 pounds; 1860, 52,500,000; 1870, 22,250,000; 1880, 25,333,000.

Georgia stands second in rice product, South Carolina 52,000,000 pounds. Georgia 25,000,000, Louisiana, 23,000,000, and North Carolina 5,500,000.

STOCK.

The following table shows statistics of live stock in Georgia for several successive census years:

LIVE STOCK IN GEORGIA.

| | 1880 | 1870 | 1860 | 1850 |
|---------------------------|--------------|--------------|--------------|--------------|
| Value..... | \$25,930,352 | \$30,156,317 | \$38,372,734 | \$25,728,416 |
| Horses, Number..... | 98,520 | 81,777 | 130,771 | 154,331 |
| Mules, Number..... | 132,078 | 87,426 | 101,069 | 57,379 |
| Oxen, Number..... | 50,026 | 54,332 | 74,487 | 73,286 |
| Cows, Number..... | 315,073 | 231,310 | 299,688 | 334,223 |
| Other Cattle, Number..... | 544,812 | 412,261 | 631,707 | 690,019 |
| Sheep, Number..... | 527,589 | 419,465 | 512,618 | 560,435 |
| Swine, Number..... | 1,471,003 | 988,566 | 2,036,116 | 2,168,617 |

WOOL IN POUNDS.

| 1850 | 1860 | 1870 | 1880 |
|---------|---------|---------|-----------|
| 990,019 | 946,227 | 846 947 | 1,289,560 |

FERTILIZERS—1879.

Georgia was the largest consumer, using in value \$4,347,000 worth; Pennsylvania was next with \$2,838,000; New York, \$2,715,000; South Carolina, \$2,650,000, and Virginia, \$2,137,000.

THE LEADING COUNTIES IN AGRICULTURAL PRODUCTS

are as follows: (1880) Burke, \$1,824,000; Washington, \$1,484,000; Troup, \$1,276,000; Houston, \$1,265,000; Coweta, \$1,174,000; Meriwether, \$1,131,000; Cobb, \$1,089,000; Floyd, \$1,061,000; Gwinnett, \$1,019,000.

MANUFACTURES IN GEORGIA.

By the census of 1880 the aggregate of all manufactures (with a product exceeding \$500 per annum), employed a capital of \$20,

672,410—operatives 24,875—paid wages, \$5,266 152, used material, \$24,143,939, and made a product of \$36,440,948.

In the Augusta Trade Review of October, 1884, the capital in 1884 is estimated as nearly double that of 1880, having increased by \$18,169,402, and now amounting to \$38,841,822.

SPECIFIED INDUSTRIES.

| | Capital. | Wages. | Material. | Product. |
|-------------------------|--------------|--------------|--------------|--------------|
| Cotton Mills..... | \$ 6,537,657 | \$ 1,141,782 | \$ 4,039,673 | \$ 6,513,490 |
| Flour Mills..... | 3,576,300 | 327,600 | 8,619,092 | 9,703,898 |
| Lumber..... | 3,101,452 | 534,085 | 3,197,195 | 4,875,310 |
| Rice..... | 35,000 | ..... | 1,309,407 | 1,588,769 |
| Tar and Turpentine..... | 513,885 | 506,842 | 490,355 | 1,455,739 |

The Baltimore "Manufacturer's Record," quoted in the Augusta Trade Review, makes the increase as follows:

COTTON MANUFACTURES.

| | 1880. | 1884. |
|-----------------|-------------|--------------|
| Looms..... | 4,713 | 7,843 |
| Spindles..... | 200,974 | 340,143 |
| Hands..... | 6,678 | 10,000 |
| Bales used..... | 67,874 | 100,000 |
| Capital..... | \$6,632,142 | \$13,000,000 |

The leading counties in manufacturing are Fulton, Richmond, Muscogee, Chatham, Bibb, Cobb, Floyd, Glynn and Clarke. The manufacturing capital in Fulton is estimated at about \$6,000,000; in Richmond, about \$5,500,000, and nearly as much in Muscogee.

The lumber capital is estimated to have increased to about \$6,000,000, and the product to about \$7,000,000.

RAILROADS.

There are nearly 3,000 miles of railroad in Georgia, forming a complete net-work, well distributed as to locality and sections, and reaching 100 out of the 137 counties of the State. The Central Railroad Company owns, leases or operates about forty per cent. of the whole railroad system. If equally distributed there would be over twenty miles of railroad to a county (counties in Georgia being small), one mile to 550 people, one mile of road to 21 square miles of area.

There are a few localities in which a wagon cannot go and return in a day from a railroad station. The lines of road would suffice to cross the State east and west about fourteen times, or north and south about nine times.

The leading railroad centres are Atlanta and Macon. Savannah and Augusta inaugurated the chief enterprises.

The capital invested probably exceeds \$60 000,000, the gross income \$10,000,000, and the net income is between \$2,000,000 and \$2,500,000.

EFFECT OF RAILROADS ON THE VALUE OF PROPERTY.

This is illustrated by the following table for the Air-Line and N. E. Railroads.

| Counties. | Value of Property. | 1874 | 1884 |
|----------------|--------------------|--------------|--------------|
| Fulton..... | | \$20,485,000 | \$30,736,000 |
| DeKalb..... | | 2,813,000 | 3,405,000 |
| Gwinnett..... | | 2,745,000 | 3,048,000 |
| Hall..... | | 2,139,000 | 2,879,000 |
| Banks..... | | 767,000 | 1,094,000 |
| Habersham..... | | 806,000 | 1,004,000 |
| Milton..... | | 808,000 | 994,000 |
| Forsyth..... | | 1,261,000 | 1,520,000 |
| Franklin..... | | 1,171,000 | 1,524,000 |
| Clarke..... | | 4,703,000 | 5,435,050 |
| Oconee..... | | | 960,000 |
| Jackson..... | | 1,686,000 | 2,491,000 |
| Madison..... | | 958,000 | 1,010,000 |
| Total..... | | \$40,322,000 | \$56,090,000 |

This shows an increase in ten years of nearly forty per cent. The per cent. of increase for the State between 1874 and 1884 being but eight per cent., viz: from two hundred and seventy-three to two hundred and ninety-five millions.

The comparative increase would show to yet greater advantage between 1870 and 1880, because in 1874, the first date in the table, the appreciation of property had already begun, in anticipation of the railroads. To illustrate this, the tax return of Hall county in 1870 was 1,067,000, and in 1874, 2,139,000—more than double the return four years previous.

The property of the nine counties through which the Air Line Railroad passes increased in four years from \$21,171,000 to \$32,995,000—nearly 56 per cent. During the same period the State increase was less than twenty-one per cent.

GEORGIA—A STATE FOR HOME COMFORT.

No State is more admirably adapted to ample Home Comfort. Many advantages are common to other Southern States—others peculiar to Georgia. What is needful to home comfort? Whatever it is, Georgia has it. Land abundant and cheap, a climate excellent for health, comfort and production; with two seasons, giving both summer and winter crops—an excellent year round climate, with moderate summers, moderate winters, delightful spring seasons, and Indian summers indescribably fine.

Building material is cheap, and a good house easily reared. The farmer is the most independent of men, with no rent to pay, no fuel to buy, with supplies of food, easily had, with soil and climate adapted to grain crops, to garden, orchard and dairy products, and equally so to poultry. Cows may be fed through the winter on barley or oat patches.

The garden, the orchard, the cow and the hen! What a share of human comfort they contribute! With fruits and vegetables, milk and butter, chickens and eggs, what a start we have towards supplying not only an ample but a luxurious table. These facilities exist, moreover not in a mere pioneer country, but accompanied by the advantages of an already established civilization, the land cleared and ready for cultivation, with railroads, schools, churches and social opportunities already provided.

Erroneous opinions exist as to safety at the South. The sense of security, essential to comfort, obtains in a remarkable degree. Nowhere does a larger proportion of the population sleep without locks on their doors, fearless of violence or theft. Her people, as a rule, are honest, hospitable and friendly to strangers.

In addition to the mere supply of food, it is easy to have choice fruits, vegetables, grapes, melons, etc., covering a large part of the whole year. In addition to provisions, there is the best of all money crops, cotton. Indeed, if one will but make home comfort

and abundance a prime object, no country is better suited to them.

A FARM IN GEORGIA, as an investment, is unsurpassed in its returns, especially to a poor man or a man of moderate means. A few hundreds or a few thousands invested here may, with good management, make a home of comfort, health, abundance, and security. Here, as elsewhere, good management is necessary; but nowhere does it pay better. Germans and other foreigners remark on the advantage of winter as well as summer crops, and of land not ice-bound in winter.

In his volume on South Carolina (equally applicable to Georgia with some added advantages here) Pike speaks of it as an "agricultural paradise," and warmly commends the "inestimable advantages for an agricultural country of having no winter, and of living in a climate in which ploughing may be carried on in every month of the year." He winds up his view with these words: "If there be an Elysium for an agriculturist, it is a fruitful soil, a salubrious climate and a delicious atmosphere in which frosts and snows are almost unknown."

We have had frequent occasion to refer to Georgia as a variety State. It is not suited alone to agriculture.

MANUFACTURING INVESTMENTS

also have especial advantages. In cotton manufactures this is eminently true. Not to dwell on them, it is sufficient here to say that the cotton and the mills are together—saving freight one way. For many cotton goods there is a home market—thus saving freight both ways. The climate is remarkably suited to the work both in winter and summer. The cost of living is low, and so the wages of labor diminished. In a word, it seems to be the place of all others adapted by nature to cotton manufactures. Many other undeveloped facilities for manufacturing exist. But they begin to be appreciated and are rapidly undergoing development.

MECHANICS.

There is a wide opening and demand for good skilled mechanics in various departments of industry. The supply of skilled labor is inadequate, owing in part to the superior attractions of farm life.

With the growing use of improved machinery and the introduction of engines, reapers and mowers, separators, etc., there is a growing demand for workmen capable of keeping them in repair, distributed better throughout the country, as well as in the cities.

Take the advantages altogether and the time is not far distant when the advice will be, "Young man, go South." We do not hesitate to say, as the result of observation and experience, that the best immigration for us is from the North rather than from abroad. Northern immigrants are soonest assimilated. Their children and ours are indistinguishable. The best means, moreover, of harmonizing the sections is by the mutual acquaintance to which immigration gives rise. Sectional antipathies are based on mutual ignorance, and rapidly disappears before mutual knowledge.

To bring this outline view of the State to a close, we quote from the Hand-book of Georgia as to the advantages it presents.

"NATURE has been prodigal in her gifts to us, and man needs only average skill and care to make here as happy homes as the world has ever known. The ground, with its wide range of productions, the sun and air and conditions of climate, the abundant wood and water, and water-power, the present settled state of the country and degree of development, and the future promise of a higher development—all point to the South as admirably suited for immigration, and to no part of the South more than Georgia."

Her relative claims, indeed, are undisputed, and her positive claims need only to be investigated to be apparent.

CHAPTER II.

FRUIT IN GEORGIA.

Under the sanction and approval of the Georgia State Horticultural Society, sixty-four varieties of apples are scattered over the State in orchard and garden culture, fifty-five varieties of peaches, thirty of pears, thirty-three of grapes, thirteen of nectarines, twelve of apricots, eighteen of plums, sixteen of cherries, twelve of figs, five of quinces, and three of mulberries. This is the sifted and expurgated list of the Society. The character of the individuals who compose this distinguished body, and the success and reputation achieved by many of them, give to their judgment on fruits the very highest authority. The catalogue that is given here, for most of the fruits named, might be easily duplicated—perhaps quadrupled if less stringent rules of testing were adopted than such as have obtained in that Society. But it is meant to be understood that every fruit mentioned in the list published by authority of the State Horticultural Society, is one entitled to rank in the choicest collections.

To the enumeration given above of standard fruits of very general culture throughout the State, and popularity, the almond, Japan persimmon, orange, lemon, pomegranate, olive and banana might be added. There are many square miles of territory in Georgia where each of these last named fruits might be easily made profitable. It will have a strange sound to many who are enthusiastic in horticultural pursuits, to hear that the entire orchard product of the State is under eight hundred thousand dollars in value, as appears from the last census. While few citizens of the State will be ready

to concede these figures as a true representation of our yearly orchard production, still it must be admitted that the great advantages offered to the fruit growers in Georgia in point of climate, soil and general adaptedness, have not been availed of as they should have been. King Cotton will have this reproach to bear among the multitude of others. The remarkable fitness of the State for producing a wide range of varieties of the most luscious fruit, it would seem should long ago have attracted to the pursuit a very great degree of interest and a large amount of capital, both domestic and external. With the exceptions of the States of South Carolina and Alabama, if indeed these be exceptions, is there another State in the Union that can match Georgia's list of valuable fruits that attain on her soil the highest perfection? Let us begin with the apple, and speak of the encouragement in natural advantages offered to those who would wish to invest extensively in its culture in this State.

If we commence our survey at the northern line of the State, we will find in the western half of that section a blue limestone formation which obtains extensively in the valleys and lower hillsides. The mean temperature for the year is about 60 degrees. With a choice of the richest land for pears and apples, in the valleys, or of lands less fertile on the hills and table lands, it would seem that nothing more was needed in physical conditions to make upper Georgia the Paradise of the apple. Frost and insect enemies in most localities throughout the Union seem to make the worst drawbacks to apple culture as well as the successful raising of most other fruits. In upper Georgia there is enjoyed on the high table lands, ranging in elevation from 1,500 to 2,000 feet above the sea level, an exemption from spring frosts that makes a very noticeable fact. While in the lower valleys most destructive frosts are experienced in the late spring, on the highest peaks or table lands, where clearings have been invited, we notice a very singular exemption from this dreaded enemy of the orchardist. The reason of this is perhaps the more equable temperature and slighter dews on the table lands. The mean temperature of Lookout Mountain is about 57 degrees, while that of Rome, 1,600 feet lower, is 62. There are apple trees standing in many places in that part of the State we are

discussing which were planted by the Cherokee Indians, and from their growth and venerable appearance, must be the better part of a century old.

Some of the popular varieties of apples grown by the orchardists of Northern Georgia are of high flavor and remarkable keeping qualities. Shockleys have been kept in perfect condition as to soundness fourteen months.

As we drop below the Chattahoochee River, we enter the true fruit domain of the State. Here we find the apple very extensively cultivated, and with most satisfactory results. The longevity of the tree may not be as great as we find it in "Cherokee Georgia," but in many other respects the inducements to engage in the raising of apples exceed those in the higher lands.

In the upper portion of Lower Georgia great success has been attained in the cultivation of both the Shockley and Horse apple. It is believed by some that the very sightliest apple orchard in the state is one of the Shockley apple as low down as the county of Emanuel. In the sea coast and Florida tier of counties, the exception to general fruit culture is found in the partial success that has been attained in the raising of apples.

To the amateur, the orchardist or the capitalist who would engage in canning or drying, there cannot be found a more inviting field for apple culture than a very broad extent of country in this State offers.

THE PEACH.

Fifty five varieties of peaches are vouched for by that high authority, the "Georgia State Horticultural Society." And such peaches! It is true that much of late has been done by haste and carelessness in the handling and shipping of Georgia peaches, to bring discredit upon the peerless character of this fruit. Peaches plucked green and sent off to market by the 25th of May, it would seem, could not be very popular outside the walls of a female high school. Still the fact stands and will stand, that taking a belt of country, beginning at the Chattahoochee, in the county of Muscogee, and following a line drawn on that parallel to the Savannah river, we will find more surface adapted to perfect peach production than any other similar extent on the earth's surface. This is a bold

assertion, but let it be tested ever so severely and we will find the proofs to thicken.

The enemies to peach culture are none of them very formidable. The borer, which, like the curculio, seems to have a roaming commission for the entire surface of the United States, very generally attacks the young tree. While this is the fact it is to be doubted if any fatal effects to the tree often follow the attacks of this enemy. Late spring frosts and rot have more to do with miscarriage and loss in the year's operations of our orchards than all other causes together. When the question of transportation shall have been settled, there is to be a splendid field of enterprise opened up to our fruit growers, and tens of thousands of acres of land will be devoted to the growing of peaches, the Queen of fruits, where we now have only hundreds. The advantages possessed by the peach grower of Georgia far exceed those enjoyed by the orchardist of any other State in the Union. Florida can never compete in the production of very early peaches. The sorts that are to supersede those of this State which are earliest in the markets of the North, are yet to be introduced. The peach grower of this State will, in all likelihood, for an indefinite period, enjoy the profits of a first market, at least three weeks sooner than any other section in the United States; and while the day of \$40 per crate for first peaches, and a shilling apiece for Susquehannas has passed away forever, the call for the highest priced peaches at the opening of the year's fruit trade, must inevitably be with this State. It is, then, only a question of skill, capital and transportation, in settling the great future of fruit culture, especially peach culture, in Georgia. If a reasonable proportion of the capital which present prospects of gain in fruit production is enticing into the business, could only be diverted towards the erection of great canning and drying establishments for the encouragement of those now producing fruit, we would find that all who handled it would flourish and paying profits be secured, and the present crushing handicap of transportation be triumphantly evaded.

PEARS.

There are thirty standard varieties of pears cultivated in Georgia which have received the approving indorsement of the Pomo-

logical Society of the State. The most of these are the best known to the amateur's list. We could easily designate names on that list which might successfully challenge comparison with any specimens of this fruit coming from any quarter of the earth. It would be impossible to show better Bartletts, Seckels or Beurre Boscs raised anywhere than can be exhibited in any section in the pear-producing districts of the State. We name these varieties, not because they are solitary or singular in the perfection they attain, but for their remarkable excellence. The introduction of that now very distinguished specimen known as the LeConte, has marked the pear culture of the State with some very striking peculiarities. The interest taken in its culture amounts to enthusiasm and excitement. The parent tree is still extant, standing, as one might say, in the very breath of the sea air. It has furnished the cuttings from which hundreds of thousands of trees have been propagated, and the promise and profits from its culture have been so great that in one instance an investment of as large a capital as one hundred thousand dollars has been made for the purpose of propagating the tree and shipping its fruit. The facts of its growth from cuttings, its almost perfect exemption from blight, its immense yield in sure crops, the size, sightliness and forwardness of its fruit have attracted to it a degree of interest which has distinguished very few specimens of the pear in its history in the United States. The sea coast country, while in a great degree shut out from the apple and peach culture, proves its adaptedness for pears in a very striking degree. It is questionable if any other section of Georgia can exhibit orchards of this fruit which make such a display of a perfect development as do those of the low country. The certainty and perfection of the crop, and the ease with which they may be sent to market in merchantable condition, gives a very flattering outlook for those who have invested in producing this luscious fruit.

GRAPES.

Thirty-three popular names are enrolled on Georgia's list of grapes. The once famous Catawba is no longer found on it. In the first two years of its introduction the promise of that particular

grape made an era in fruit culture in the South. Hundreds of acres of land were trenched two feet deep for vineyards of the Catawba, and the reports of the crops were flatly denied by Mr. Longworth as impossible, who at that day was the leading authority on Catawba cultivation.

Single canes with forty pounds of perfect grapes have been exhibited at the State Fair, and the hopes and expectations of the friends of the Catawba were excited to the highest point. But, strange to say, in a short season the soil of Georgia had no hospitable spot left for its growth and every vineyard in the State was pitilessly extirpated. Now, however, it has been discovered that the table lands of our mountains will grow this particular grape to perfection, and we may expect to see a new reign given to this almost peerless fruit.

The Concord grape, like the Bartlett pear, has secured a popularity in Georgia which has made it ubiquitous and also conspicuously the choice of the million.

The Delaware, at the present, heads the list as our most merchantable and valuable table grape. How long this lead will be maintained cannot be predicted with any degree of assurance, as new and taking varieties are constantly offered to experimenters.

The Diana, the Pocklington, the Duchess, are coming into most favorable notice and formidable competition with the old favorites mentioned above. A good, sound and most palatable wine can be had for everyday domestic use from a mixture of Clinton, Concord and Hartford must. All that is needed to secure this addition to the list of our table comforts is a little care, some skill, and a desire to be advanced a little beyond the pristine formula of "hog and hominy." The catalogue of most desirable grapes is long enough, as enjoyed by all amateurs and vintners in Georgia, to satisfy the most exacting.

It is needless to recount these varieties at length, as the thirty-three sorts already alluded to are every one vouched for by our State Horticultural Society whose authority ranks with the highest in the land.

The State of Georgia enjoys, with almost every other Southern State, the rare felicity of being a possessor of that superior grape

known as the Scuppernong. The highest latitude for this grape is the State of North Carolina, and we believe the more temperate localities there are required for its full maturity. But from the mountains in Georgia to her sea-coast line this grape is brought to perfection. Like asparagus, however, it seems to delight most in the salt air of our sea-coast lands. This grape is "*sui generis*," its class, as all know, is the *Rotundifolia*, bears transportation well, makes several distinct types of wine, all highly perfumed and of delicious bouquet, and a brandy of unequaled excellence. If we were to be restricted to a single vine, it is likely the Scuppernong would receive a larger vote for a survivorship than any other single name in the catalogue of favorite grapes. It is a most reasonable thing to expect in the not remote future, that an important and lucrative industry will grow out of the production and handling of this very noted and striking type of the grape family.

Without too much minuteness of detail in speaking of the adapt-
edness of soils and climate as regards grape culture in Georgia, it may be said with great confidence in the facts as experience has recorded them, that no State in the Union is better provided in natural conditions for a successful growing and manufacture of the grape than Georgia, and in some sections, the mountain and sea coast sections notably, advantages are at command which make these localities exceptionally fitted for the business. In the middle portion of the State, however, for a district included in one and a half or two degrees of latitude, is the coming great vineyard industry of Georgia. The impulse tending to this result is now strong and well established, and one thing only is wanting to it to accelerate the consummation to be wished. The small producer should be left to the single effort of raising perfect fruit. It is doubtful if harvesting itself should be the business of this man, but after the vintage is made, the time, manner and labor of gathering should be the business of the manufacturer or shipper. The expense of machinery, buildings and cellars, as well as the costliness of the skill needful to the production of good wine, place it out of the power of the ordinary vintner to reach encouraging success. Organized capital will be required to bring grape culture to that degree of development and permanence that will enroll it among the

great material interests of the State and the South. One large establishment that would purchase and manufacture the fruit of a wide scope of country would give such encouragement to the small growers of grapes as would make this culture among the most delightful and profitable known. Nature has done her part, and most bounteously, but it is work just half accomplished, as our part is left undone.

OTHER FRUITS.

The Nectarine does well in most of the localities where the peach succeeds. The excellence of the fruit is universally admitted, and yet the amount produced is singularly disproportioned to the facility and perfection of its growth. The losses by that perverse miscreant among insects the "little Turk," may have much to do with the limited production of the Nectarine, really one of our finest fruits. The Apricot, when the early spring frosts are escaped, does well in the upper and middle portions of this State.

There has been of late an introduction of a plum into the orchards of this State, which in many respects makes it one of the most gratifying contributions to our fruit list. The "Wild Goose" plum is taking the country, and the certainty, abundance and quality of its crop deservedly places it high on our list of fruits. We have many other plums, some of them of the same type as the "Wild Goose," which are quite worthy of culture. But the improved sorts as they are popularly known, such as the Green Gage, Coe's Golden Drop, Jefferson, etc., etc., so seldom escape the ravages of the curculio as to make attention to these varieties usually disappointing. To those, however, who have much interest in this type of fruits, it may be of some consequence to say that on the St. Mary's River, in this State, the curculio has not yet made its appearance, and on our high table lands the "Little Turk's" usual destructiveness is not felt.

The Cherry is extensively raised, and 16 varieties of the most approved sorts go to make up the list. The Morello, however, has stood the test of trial better than any other, and although it has never risen high in the popular esteem in comparison with other fruits, it has been a question with many if the Morello cherry extensively cultivated in its proper habitat, would not prove as a market fruit really more profitable than any other in the catalogue.

The Quince is attracting much attention, and as it can be raised throughout a very wide expanse of the State and has to encounter fewer ailments and accidents than either the peach, pear or apple, it is to be expected that in the case of such a desirable fruit for preserving, canning and domestic use, it will become very popular and profitable.

The "ever bearing" Mulberries must not be overlooked. It has been asserted of late years with great earnestness by those most experienced in this specialty, that with Bermuda grass, red clover and an orchard of Hicks or Downing Mulberries, the raising of pork can be reduced to the merest trifle. One hundred yearling hogs to twenty-five matured trees of the ever bearing mulberry have been kept in first-rate condition from April till August without a morsel of other food, or even water. This fruit, so utilized, is one of the coming events of progress and enlarged domestic resources. This tree flourishes throughout the State, and the sandy lands of lower Georgia are especially adapted to it.

The Fig comes last upon the list of fruits, the enumeration of which is here given, but it by no means ranks as least. It has been a curious fact that while this fruit, having such a fixed place and large value in commerce, was of such easy and sure culture, no available method of curing it has as yet been introduced. There seems to be no sort of difficulty in realizing immense crops of figs in all the Southern portions of Georgia; and the quality of the fruit is probably as good as any we import from Smyrna. But to prepare the fig as we find it in the market, in drums and box packages, has exceeded our skill and the surplus of the crop after family use and the distribution to poultry and stock, brings no revenue. This cannot continue; the loss is too great and the solution of the hidden mystery, why figs will sour in drying, must be achieved. When it is, and large crops can be put on the market in merchantable condition, many thousands will be added to the resources of that part of our population whose location enables them to produce this fruit.

In concluding what we have to say on "Fruit Raising in Georgia," the sweet and sour orange must not be overlooked.

The sweet orange, and of finest size and flavor, may be easily raised for family use in any of the lower counties in the State and in paying quantity on any of the sea islands on the coast. Groves of the sour orange anywhere in the same localities are found, and for the manufacture of preserves and a delicious dessert wine, very similar to the famous Chateau Y'quem; this fruit will no doubt prove to be greatly more profitable than many of a more pretentious sort.

The outlook for the fruit-raiser in Georgia is most flattering. By consulting the last census it will be seen that while fruit production has signally declined in some of the old States noted for their large crops, in the South, on the other hand, the yields have largely increased. We are sanguine that we will see in a very few years our production of fruit in Georgia greatly augmented, and our present very moderate annual orchard valuation of three-quarters of a million dollars carried to a figure that will attract wide attention.

The impulse towards this result has been extensively felt, and we have orchards in Georgia of 70,000 peach trees, pear orchards of 8,000 trees, and vineyards of 10,000 vines. Let us have the aid and encouragement that large preserving and canning and wine making establishments would surely supply to this great and pleasing interest of fruit growing, and in one decade we might reasonably expect to see the annual profits for the State counted by millions.

CHAPTER III.

GRASSES IN GEORGIA.

The number or varieties of native grasses is very large, and the recently awakened interest on the subject of grass production and culture is constantly adding to the list. At short intervals, specimens of new grasses are sent in to the Department of Agriculture for name and identification, and it is probable that most valuable additions will be made to our already long catalogue from our own swamps and fields.

Now the production of grasses, and not their destruction, has become an object of prime importance with our farmers, we are

sanguine of very large results, so far as our profits are concerned, and the impulse that will be given to such rural pursuit as will not depend entirely on tillage and the laborious and expensive use of the plow and hoe. The 3,000,000 live stock which Georgia must care for principally with the grass and hay resources of her own soil, will compel a due degree of attention to so obvious and valuable a department of our agriculture. The most prejudiced minds, as well as those most stubbornly attached to old processes and cultures, are beginning to understand how it is that wealth and comfort, as well as comparative ease, can be secured by the farmer without the help of those leading staples that we have been taught to believe constituted the whole of a sensible agriculture.

No State in all our wide domain, for the same area, can offer to the stock-raiser or dairyman larger or better-founded inducements than Georgia. Beginning at the sea coast, we have the tender salt marsh as early as January, which makes no insignificant reliance in that season of the year that in so many sections is one of pinching and precarious existence for stock. By the first of March the open woods grasses appear. These consist of the piney woods sedge, the celebrated wire grass, with innumerable patches and bodies of switch cane, which keep cattle fat even during the most inclement winter months. Besides these, the Spanish long moss, such a striking peculiarity of the low coast latitudes, all through the winter continues succulent and nourishing, and is eaten greedily by all stock, and upon which oxen will do good work in the absence of other forage. But better, far, than any or all of these is that world-renowned grass *Cynodon Dactylon*, known in India as the "Danb" or sacred grass, and throughout the Southern States as *Bermuda grass*. This grass is not propagated by its seeds, and indeed it is not thought to mature its seeds in the United States, at least by very few having any experience of its habits. It takes deep hold in the soil with its mass of roots, besides covering the surface with a superficial network of twine-like runners which make one of the most compact swards of which we have any experience. While this grass requires some nursing to give it the necessary height for mowing when it is grown on uplands of moderate fertility, it invariably attains a growth on low lands, or high

lands in good heart, that makes the mowing by machinery an easy matter. A peculiar advantage in growing Bermuda grass is found in the fact that in the lower portion of the State the vetch grows luxuriantly in the midst of the very thickest of the sward, while in the upper sections the white clover will also put up through the interstices of the runners and give a good nip for the sheep or Jerseys during the winter months. The farmer of experience, who knows to his cost what it is to feed a herd of cattle during the cold weather of winter, will know how to estimate the value of a grass that men say can never be got rid of; that ties the most washing soil together; that catches and holds every particle of manure that is dropped on it; that in the lower sections of the State will give a pasture every day in the year, and in other sections will afford it for nine months in the year; that restores a worn soil in a greater degree than the far-famed Blue grass, and that on rich land will yield 20,000 pounds of hay that by a strict and most authentic analysis shows as high as 14 per cent. of albumenoids. This, upon as high an authority as the late Dr. St. Julian Ravenel, makes the hay of Bermuda more valuable than that of the celebrated timothy. It would be an injustice to this most remarkable and valuable grass not to mention its peculiar adaptedness to sheep raising. It seems, in its fattening qualities as well as its healthfulness, to be beyond comparison the very best pasturage for sheep. Its capacity per acre for supporting a flock is well known—no one placing the figures at less than five head to the acre, and some of the best judges and most experienced flock masters giving the number as high as fifteen to the acre. Everything considered, that people who have the possession of such an invaluable product of the soil as Bermuda grass is most fortunate indeed, and it would seem to be an inexcusable want of thrift wherever it will grow not to have an unfailing supply of the very best forage that is produced in any quarter of the earth. There cannot be a question of its superiority as a grass and hay producer over anything known in Europe or the United States.

There is a forage plant now rapidly coming into notice and popularity, in the lower part of the State, and known as Beggars Lice. It belongs to the genus *Desmodium*, and on good land grows to the

height of six or eight feet. The crop comes on after a corn crop generally, and spontaneously furnishes, in the shape of a most acceptable forage, an amazing amount of rough food for stock. Every hay eating animal seems to devour it not only with relish, but greedily. It is not known how far above the tier of counties co-terminous with Florida this valuable forage plant will thrive, but certainly all those who are located in its habitat are most fortunate in their possession of this invaluable resource.

In addition to the forage and hay plants already named, the crab grass and crow foot should not be forgotten. While the crow foot is, in a great measure, confined to the lower belt of counties in the State and seems to delight in a light, sandy soil, the crab grass, on the contrary, seems to be at home on every square inch of soil within the boundaries of Georgia. It is one of the unsolved mysteries of nature, that anywhere, and everywhere in all the millions of broad acres of Georgia and of the South, the seeds of this grass are reposing in a dormant state, it may be, but only waiting the call of certain conditions to bring them into active life.

If there is one solitary grass or vegetable product in all the long catalogue of those common to the Southern States that can, with strict exactness, be called *native*, it certainly is that plant called "Crab Grass." It comes unbidden and as a most unwelcome visitor in our tilled crops. But if our fields are left unbroken after a harvest, that other universal crop known as "Rag Weed" usurps the ground and leaves no chance for the growth of grass. It has, however, been often noticed that fields sown in wheat in November will invariably bring on an after-crop of the Rag weed—those sowed in spring oats will produce crab grass as an after-crop. The reason given is that the weed seed which are exposed by the plow in the spring, have begun to germinate and are destroyed by exposure, leaving the later sprouting grass to take their place. If our lands that have been laid down in small grain are broken up after harvest, a crop of hay from crab grass may be mowed that, in a majority of instances, would no doubt be greatly more valuable and bring larger money returns than the crop of grain that preceded. While there may be grasses more nutritious and we place the great Bermuda in this class, we doubt if, in all the grand catalogue of forage

hay plants, there can be found a more delightfully scented grass, than the crab grass, or one that would be as soon selected by stock if left to their choice. Its milk producing qualities are all that a dairyman would ask. It is not deemed exactly germane to a description of grasses and forage plants at the command of the Georgia farmer to embrace in that enumeration such as Millo Maize, the numberless sorghums now in use, or the Indian corn. The supply of the very best provender for all stock which this family of plants can furnish is simply without limit. But the object of this tract is more directly to point out to those not so familiar with the locality or our husbandry, those plants that are most available and more restricted to the State of Georgia and correlated sections. Then let us pay our respects to the Cow Pea—*Dolichos*, as named in the books. Surely here is a Prophet without due honor in its own country. It was a favorite saying of an enthusiastic writer on the South and its products that, "that country which possesses the Cow Pea, Sweet Potato and Bermuda Grass, must be better than any other land that does not possess them. It is a remarkable fact that this plant should, to the present hour, be so moderately rated, and while it silently has had accorded to it by all those who are most dependent on it and the most profited by it, the praise it deserves, still its reputation is far more restricted than seems reasonable.

A plant that will thrive luxuriantly in poor land with less help than any other known; whose roots thoroughly subsoil the land; whose leaves and vines will rapidly renovate the most wasted soil, and whose fruit furnishes the most strengthening food for man and beast, and whose forage product is not excelled by even the world-renowned red' clover itself, it would seem, should be prized as among the most beneficent gifts to that land that has been blessed with it.

As we ascend from the coast and lower Georgia we come into the region of "piney woods," the true habitat of the well-known "Wire-grass." For a large portion of the State, fully one-fourth of it, this peculiar growth spreads itself everywhere. Its habit is to grow in clumps, very much as the Orchard grass does, and it is a perennial. To look at it as it covers the ground in winter, a stranger would not wonder at its perennial form, but could easily

believe that it was indestructible. Harsh and repulsive it would no doubt seem to the man of the North or West who was accustomed to the tender and succulent growths of his section. But, little as this individual might at first be disposed to regard this ugly customer, he will find on inquiry that the real beef range section of Georgia was found exactly in this home of the wire grass, and that the only flock of sheep worthy of the name in the State roam over the sea-like expanse of this growth in the forests of our pine timber. There are flock masters in this region that number their sheep by the thousand, and on an expense of fourteen cents a year per head, or no expense at all, winter or summer. They derive large incomes with as nearly no labor or care as could be said of any gains whatever. When the old stubble is burned off in the early part of the year, and the tender grass shoots up, all animals running on it for pasturage seem to thrive and be well satisfied. The part of the tussock that stands all winter will, in all cases, conceal under its covering a portion of tender growth that sustains the stock that range over it during the hard times of the winter months.

It is proper to state, in dismissing the subject, that it has been often remarked by judges well qualified to decide in the case, that, everything considered, health, water, clemency of climate, cleanliness in the fleece, proximity to a good market, that the "wire-grass" section of Georgia made altogether a better sheep walk than either Texas or New Mexico. Sheep husbandry is one of the coming great industrial interests that is to magnify the Empire State of the South beyond all present conceivable limits. It would seem that a business that paid 63 per cent. while left literally to run itself, should invite immigration and capital with irresistible eloquence and logic. In the near future we will see, no doubt, as many sheep in a single county of the wire-grass country as are counted now for the entire State.

As we ascend from the low country we reach a section bounded by the 32d and 34th parallels, that possess in a rare degree an assemblage of physical advantages and comprehensive range of production that very few portions of our country can justly claim. Here will be

found the Paradise of pear, peach, apple and grape culture, associated with the invaluable clovers and lucern. The success which has followed every intelligent effort in the culture of red clover in the red clay sections of Georgia, has indeed proved to be a revelation as well as a surprise. For the last 50 years we were deterred by the turpentine farmers of North Carolina from attempting the utilization of our pine forests in competition with them, and we were as effectually scared away from clover raising by the warning of our Kentucky friends, who were absolutely sure that red clover could not be made to grow in Georgia. By stealth, we might say, we have made the venture—in spite of our misgivings and slack experimenting. The fact has forced its way, that red clover will not only do well in Georgia, but that in almost every section of the State where you can get out of a “blowing sand” you may have fine crops of this great product. It is simply a question of proper fertilizing, and not a question of soil or climate, whether you may have clover or not. So far from not being able to succeed in making its growth advantageous here, we challenge the United States to match the crop of Col. G. W. Scott, of Decatur, in DeKalb county, in this State, who, on one measured acre of land, housed nearly 17,000 pounds of well cured clover. A Northern gentleman, interested in such matters, reported a crop raised in the same neighborhood, on a very ordinary plat of soil, to the *New York Sun*, which made upwards of 4,000 pounds of well dried hay the first cutting, and at an expense of just seven dollars. Counting the second cutting, this it would seem should be satisfactory. No doubt, in a great number of experiments, as good results are occurring every year. The crop in Georgia will pay for four years from first sowing, and we have known in the city of Atlanta eleven crops raised from one sowing. Our friends in Kentucky, who for so long kept us out of the danger and folly of clover husbandry, we believe, do not count on more than two crops from one sowing.

In all the clover raising localities we may count securely on having a good nip for almost any grazing stock during the late and early spring, as the time of rest for the plant is during the months of July and August. As the companion of red clover, we are singularly blest in the possession of the Queen of all forage plants—

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Incarn. In the latitude of Atlanta (about $33\frac{1}{2}$ degrees) this plant is high enough for a fine cutting by the 15th of February, and four more may be had if the seasons are at all favorable during the year. This herbaceous plant is perhaps at the very head of the list of all known varieties adapted to similar uses. By experiment, it has been tested and proved to be the most nutritious of all green food for stock, and that one ration of grain a day will take a horse or mule well through his day's work if it is supplemented with lucern hay. The preparation of the land that is to support this crop must be thorough, and it is not extravagant to apply as much as 35 dollars of outlay for a single acre. But when it is remembered that a crop of five tons of hay per acre is not at all remarkable, and that properly cured is worth 30 dollars per ton, it will be seen how much better these profits are than those from cotton, corn, wheat or tobacco.

In Georgia, we may count on twenty years' service from a plat of lucern, and that every well set acre of it will keep five head of horses or mules for a twelve months. The objection to it and about the only one is, that it will not bear the hoof, and it is strictly speaking a soiling crop. We have omitted to mention the fact that lucern, unlike the red clover, will do well, in fact, yield abundantly, on the sandy lands of our coast counties, and it is likely, with proper manuring, will afford good cutting for every month in the year.

In concluding mention of summer grasses native to Georgia the "Broom Sedge" should not be forgotten. This native to our soil is of almost universal prevalence on all turned out or worn lands, and although it has become fashionable to regard it as the synonym of a poverty-stricken soil, it has merits that make it no contemptible resource to the stock keeper. It is early in starting, is highly relished by all stock and has a most unquestionable suitability to young stock. It is a common saying, that with broom sedge pasturage one may raise a mule on what it costs to keep a calf. The trouble with this grass is that when grazed it is soon overtaxed and will not reproduce its stand or extend it, and dies out unless protected every two years from the tramping and bite of stock.

WINTER GRASSES.

Among the chief of these well known in Georgia husbandry is the "Tall Meadow-Oat Grass." This grass, on well manured land, will grow often six feet high, and on lighter lands than any other grass in popular favor. The yield is very heavy when the crop has been well cared for, and is just the grass for our cotton belt, supplementing the Bermuda grass while at rest during the winter. The seed of this most excellent grass ripen before the stalk and may be saved by the cradle before the bulk of the crop is ready for harvesting. Like the wire grass, the meadow-oat hides in its tussocks, during the winter, a very large proportion of nutritive green stems, which are highly relished at that time by all stock.

ORCHARD GRASS.

This is among our very earliest grasses—keeping green all winter, and at the first breath of spring attaining a height that makes it available for pasturing. It comes in directly after the first cuttings of lucern, and from its tenacity in keeping its stand wherever sown—its nutritious quality and the facility with which it takes possession of orchards or woodlands, it is most deservedly becoming a favorite among grasses in Georgia. A mixture of tall oat and orchard grass, red and white clover make the perfection of a sward for either pasture or a hay crop.

BLUE GRASS.

While it is not a fact that the true blue grass will not do well in Georgia, we yet have so many other varieties of pasture grass that are more easily set and matured, that very few have attempted its culture on a large scale.

It is, however, a widely known fact that no one has ever yet attempted in the northern and middle portions of the State to grow this grass who has not done so with very satisfactory results. With the proper manure, one having the elements of lime and phosphoric acid in it, no one may feel the least doubt in their effort to establish as perfect a blue grass sward as could be asked for anywhere. Our blue limestone lands in the mountain counties, and our rich coves will produce this grass to the heart's content, if its culture from habit or choice should be a desirable object.

One peculiarity this grass has developed in this State, its stubborn hold on the soil, where once set, exceeds that of all known grasses. Spots once set in this grass by the feeding of cavalry horses during the war are to this day occupied by it in spite of bad usage and the incursions of broom-sedge, which has heretofore been considered as having the mastery over all other grasses.

The list of grasses which may be and are produced in this State with profit may be concluded with Red Top and Herds grass. Both of these well known and popular grasses are easily raised in any suitable soil in the State. They both require a rich and moist bed to develop the best results. Their use has not spread to any great extent among our farmers, for the reason that other varieties have proved to be of easier and more remunerative culture. It is due to the people of Georgia engaged in the business of agriculture to state a fact which will explain to some extent what may seem to be a very inconsistent thing, when the capacity of our soil for the production of grass and forage plants is considered. By the last census the hay production of Georgia is placed at a little over 14,000 tons; in comparison with the five million tons of New York, or the three and a half million tons of Illinois, or the larger yield of Iowa, this return seems to be a most insignificant and beggarly one. But it must not be overlooked that our shucks and fodder from the blades of our crops of corn, used by us in substitution of hay, must amount to many thousands of tons. The mass of this offal, which it may be called, derived from a crop of 30,000,000 bushels of corn, must be very great. Its substitution for so many tons of hay as provant for stock is not by very far so great a mistake as the economic one, when we come to consider the comparative cost of production, with provender raised from mowed grasses.

In concluding what is to be said on grass husbandry in Georgia, it would be an inexcusable neglect to omit mention of our mountain ranges, and the valuable grasses and herbage which abound in all that section of the State. High as the elevation of that portion of Georgia is, as to both altitude and latitude, stock of the lighter sort, as young neat cattle, goats and sheep, are able to subsist during the winter almost entirely on the natural growth of the range. All through the spring, summer and fall months stock not only live, but do well on our mountain tops and valleys. The abundance of grazing and browsing which these localities supply for a

large portion of the year, makes the mountain region of Georgia one of the most desirable for stock in all the State. It is not an uncommon thing for young cattle to be bought up at low prices in the neighboring valleys, then moved into the mountain walks, fattened, and in the fall sold in the larger markets at a great advance on first cost. Experiments in the raising and keeping of the Angora goat in these mountain pastures are making a very favorable impression. It is thought, with much reason, that this particular branch of stock raising may be easily carried to a very large and important development in our mountain counties. The adaptedness of this locality to the raising and support of the Angora has been so marked that those accustomed to the care of this valuable animal are sanguine that we shall see in the near future a very important source of profit in this branch of industry. If mills could be made accessible for the manufacture of mohair, there can be no doubt that a stimulus would be given to the production of this material, which would raise it to a high rank in the list of industries in Georgia. It is hardly possible that the native habitat of the Angora is better adapted to its keep and development than are the mountain counties of this State.

CHAPTER IV.

GARDEN PRODUCTS.

Under this head the entire range of production as adopted by the truckers of the State may be considered.

It is demonstrable that when all advantages are considered which are needed by the gardener to insure success, the southern portion of Georgia presents inducements superior to those of any other portion of the United States. This fortunately located section embraces fully 20,000 square miles of the State's surface. While the State of Florida, as regards high temperature during the colder winter months, may give some superiority over the truckers and gardeners of Georgia, still the balance of advantage is decidedly with the latter when all the conditions to success are considered. The Florida producer must come in competition with the trucker of Bermuda, in the earlier crops sent to market, and at a disadvantage, while it is notorious, that in the most important item of

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melon production, the soil and climate of Florida cannot compare with those of Georgia.

This may also be said of the Irish potato and cabbage crops, both ranking in importance in the list of the trucker's products next to the melon crop.

The great question of transportation is one that is not only important in all discussions of this topic, but it is vital. The bulkiness and weight, as well as the perishable quality of most garden products, make it of the very greatest consequence that the facilities for moving the crops, when made, should be at hand. The sea-coast section possesses a rare advantage of water carriage, not only to the side of the outgoing ship which takes its great bulk of freight to the Northern market, but in very many cases permits the small lighters to receive their loads from the very spots where they were produced. All who have any experience of the loss that results from the violent jolting and careless handling of fruits and vegetables will see at a glance what an advantage it must be to be able to move tender garden products to the point of final shipment without the often necessary loss from bruising and crushing in the handling. It is the opinion of many of large experience in the business that no localities in all the broad limits of the Union include in their claims of advantages for the gardener and trucker as many as the sea-coast of Georgia. Advancing from the coast line towards the counties in close proximity we have the same benignant climate and suitable soil that one may have anywhere on the immediate coast, with convenient and well organized railroad transportation. The Savannah, Florida and Western, the Virginia, Tennessee and Georgia, and the Central Railroads, all first class in their accommodations and management, furnish the amplest means of transportation for thousands of square miles of the most admirably adapted soil for the business of the trucker and gardener. Then there are other connecting lines that penetrate this section of the State, which leave very little more to be desired in the way of convenient transportation. The interests involved in even the present development of the trucking business in the State of Georgia are so important that they will force such terms on the lines of transportation as will make this pursuit one of the most remunerative, both

to the producer and transporter. It may be said to be just in the dawn of its success. Already, in certain favored localities, real estate has been enhanced one hundred and fifty per cent. on the prices of a few years past. From the port of Savannah alone the shipments of watermelons in one season amounted to one hundred and seventy-five thousand, and of vegetables there were sent off one hundred and eighty-five thousand crates and forty-nine thousand barrels. The statistics of the melon trade are not full enough to give exact figures as to the extent of the annual production in the State, but must be very large. By rail thousands of tons are shipped North as far as Chicago and St. Louis which, when added to the shipments by steamers, illustrate the growing promise of the trade. The lands which are so peculiarly adapted to this promising industry can be bought for prices ranging from two to twenty dollars an acre. The climate and water may be said, in a vast number of localities, to be unexceptionable, and the population for the most part compares favorably, in all the externals of healthfulness, with that of any other portion of the State, or of the South.

It may not be out of place here to enumerate some of the most important staple products which engage the attention of our truckers and gardeners. By many asparagus is regarded as the chief among the vegetables of commerce. If its cultivation is considered in reference to the advantages of its peculiar habitat, the lands of the coast district, as also its adaptedness in its handling and marketable qualities, it will no doubt be found to justly occupy the rank it holds in the list of valuable garden products. The stock sent to market for all preceding years has proved to be entirely inadequate to the demand. The earliness and rare delicacy of this vegetable, its wonderful productiveness, and the fine condition in which it reaches market, all give it first rank in the list of marketable vegetables. The profits, at the price often obtained of from nine to twelve dollars per dozen bunches in the New York market, it would seem ought to make asparagus very desirable as a staple market vegetable.

Snap beans are very extensively cultivated, and a crop of one hundred and fifty crates an acre is common. The price obtained in the northern markets is from one to four dollars a crate,

The beet is one of the staple market vegetables, yielding heavily, and bringing from two dollars per barrel and upward.

The cabbage is perhaps the most extensively cultivated and marketed vegetable in all the list grown by our truckers. The yield at times is enormous, and in the mild season, during which this crop is brought to maturity in the coast country, admits of very close planting. It is not unusual to have a plant on every two feet square of a field, giving upwards of ten thousand heads an acre. Two hundred barrels an acre on a patch of eight acres have been secured in the neighborhood of Savannah, which brought four dollars per barrel in New York market. Freights from Savannah by steamer can be had for fifty cents per barrel. Commissions on sales are about eight per cent.

The cauliflower finds in the sea coast region its most favorable locality. Shipments can be made by the 25th of March, bringing for a crate of twenty-two heads nearly eight dollars, and as much as twenty-five dollars per barrel. Ten thousand plants may be raised on an acre.

The cucumber is regarded as ranking very high as a vegetable of market value. Perhaps the very largest market return from a single acre of any vegetable yet made has been derived from this vegetable, the sum, as reported, reaching eighteen hundred dollars. This crop was grown near the city of Savannah.

Egg plants do well, and bring six dollars per barrel.

No portion of this continent certainly can exceed the production of onions which the garden section of Georgia can show. One thousand bushels can be gathered from a single acre.

Garden peas make a very important item in the shipments of garden stuff to Northern markets. They grow to great perfection, producing from 150 to 200 crates per acre, and bring from one dollar and fifty cents to five dollars and fifty cents per bushel.

With the exception possibly of cabbage, the largest shipments of our truckers in vegetable products is in the Irish potato. It is very questionable if when soil, the resources of local manures, early maturity and transportation are considered, there can be named a more advantageous region of earth for the profitable culture of the Irish potato than the sea coast lands of Georgia. With the drift of salt marsh, oyster shell, shell-lime, and the marsh mud, for a com-

post, no section of the Union can excel the land we speak of, in large and fine crops of Irish potatoes. The quality is as striking as the production. One hundred barrels is a result easily attained, and the crop will realize from three to six dollars per barrel.

The sweet potato, it is hardly necessary to say, finds its true home in this section. If people out of the Southern States could ever be induced to give a sweet potato a living chance in the kitchen, the profits of its culture might be made to reach wonderful figures. All the best varieties of this vegetable, which might well be classed in the family of rare fruits for its excellence, can be, and are, grown in Georgia. From three to five hundred bushels per acre can be easily raised, and the spring prices even in the home markets are very often extravagantly high and always remunerative.

Watermelons, which are to be included in the trucker's list, make the grand show in the wide enumeration of his year's crops. Thousands of acres of the best adapted lands in the world are devoted in Georgia to the cultivation of this glorious fruit. All the world knows that on Georgia's soil it has attained its highest perfection, and when the rates of transportation shall have been adjusted to a sensible and business ratio, the watermelon trade will reach a figure that will be of vast consequence to the State. One thousand melons for an acre properly cultivated, is a reasonable yield, and these bring in Boston and Baltimore from 25 to 50 cents if reaching market before the later crops produce a glut.

Strawberry culture is beginning to assume large proportions. Fields of twenty acres or more in the southern part of the State are heard of, and although the crops are not as large as some that are reported for localities higher north, still a yield of six thousand quarts for an acre is attainable, and three thousand quarts are by no means uncommon. Reaching Northern markets, as this fruit does from Georgia, late in March or early in April, the price ought to be quite satisfactory, as it ranges from 35 to 50 cents a quart.

Fruits and vegetables are the familiar products of every home in the State. It is very hard to name a single State in the Union that offers to the gardener or horticulturist a wider or more eligible range of productions in his specialties, than can be found in the State of Georgia. But when the man of small or large capital is invited to

invest in the particular industry here discussed, we mean to designate the sea coast and the southern portion of this State, as not only peculiarly adapted to the business of the market gardener, but pre-eminently suited to it

CHAPTER V.

FIELD PRODUCTIONS OF THE STATE.

There may be States in the Union which, in proportion to area, claim a larger number of acres of very rich lands than Georgia. There are, no doubt, certain sister commonwealths which, in their adaptedness to certain special products, largely exceed the capacity of Georgia production. But for the superficial extent of Georgia, it is questionable if there is another State in the Union that is more generally adapted to the production of those necessities and comforts of life that constitute the resources of a prosperous and happy community.

There is hardly a section of the State that is not able by the natural resources of its soil and productions to sustain a population in great comfort, and for her number of square miles it is doubtful if there is a State in the Union that can count in its limits a greater number of healthful localities. Cereals do well, from the mountains to the seaboard, with probably the single exception of wheat, which has been neglected in the past history of the agriculture of the State on the sea-board, from the idea that it could not be profitably raised there. The few instances where this culture has been attempted, have developed some very remarkable results in its favor. As large a yield as forty bushels of good wheat on an acre has been produced on the sea-coast of South Carolina in a "biscuit's toss" of the salt water. In the northern and middle belts of the State, grain production, with clover and the grasses, offers every encouragement. On lands naturally rich from the peculiarities of their location, large yields of grain are very common, rising as high as 35 and 40 bushels of wheat and 70 bushels of oats per acre.

On lands of inferior grade of fertility the product of small grain and Indian corn is a question of fertilization only, and not one of soil or climate. The annual crop of cereals for the State will

amount to fully fifty millions of bushels. This production could be vastly increased, if the strange fascination of cotton culture could be dispelled and wiser counsels prevail. The tendency of the popular judgment is towards this reform, and when it shall be materialized and its full influences felt, the provision that will follow for the support of "man and beast" will be ample, if not superabundant.

The rice crop, once such a material item in the annual census of Georgia's production, is at present reduced to less than forty millions of pounds. The wet culture of this grain has, since the war, been greatly circumscribed by the repugnance felt towards it by negro laborers, and it is now being substituted by the upland crop. Gradually this industry is increasing and acquiring very considerable importance, and it is not at all improbable that rice production will be so generally diffused throughout the State as to make this grain one of the staple articles of domestic use on our farms.

Sugar production in Georgia might easily and most profitably be carried to a high figure. Every county in the extreme southern tier of the State bordering on Florida could make the sugar crop a most advantageous one, and if their capacity was supplemented by the yield of cane that the counties adjacent to these are well adapted to produce, a sugar supply for the whole State, would be a matter of easy achievement. Very partial returns of sugar made in Georgia place the figures as low as 600 hogsheads, but there is good reason for believing that this return does not, by any means, give the proper amount raised and consumed on the farms in the cane-producing section. The average yield of syrup from sugarcane is 200 gallons per acre, though as much as 600 gallons an acre is by no means uncommon. This average yield would give at usual prices (\$76.80) seventy-six dollars and eighty cents an acre—a result far better than the ordinary profits on an acre of cotton. Sorghum, both for forage and syrup, is now one of the fixed and popular crops in Georgia, and it is a historical fact that the people of this Union are greatly indebted to this State for the first dissemination of this most valuable agricultural resource. The profits from sorghum may be placed at from thirty to fifty dollars per acre.

The adaptability of the climate and soil of Georgia to the produc-

tion of Indian corn is as extended as the limits of the State. The northern and middle portions of Georgia may be said to be pre-eminently suited to this crop, now regarded by the whole world as of cardinal importance to the well-being of man. But while these portions of Georgia may be said to possess pre-eminent advantages for the production of this staple grain, as perfect corn as can be grown anywhere may be seen in the fields and barns on our immediate sea coast. It may be said to have its habitat on every acre of arable land in Georgia. The crop is between twenty-five and thirty million bushels, and costs in producing it one cent a pound. Oats are becoming more and more a favorite with the most intelligent and thrifty of the farmers of this State. As a feeding crop for work stock it has assumed the first importance and rank, and the annual product which is now about seven millions of bushels, will be augmented steadily until it will, in all probability, supersede the old favorite Indian corn as a grain for work stock. The cost of oat production is about the same as corn, about one cent per pound. The striking advantage in an oat crop in Georgia, is the fact that it may be either a fall or spring crop. Should the better plan of fall sowing fail, from the unusual severity of the winter, the farmer has the chance of the spring sowing, which often proves very remunerative. There is a great future for the oat, in the prominence which this crop must assume in our farm economy.

COTTON.—The whole world knows the rank which Georgia holds as a cotton-producing State. She now stands third among the States of the Union in her number of bales. Her crop may be set down at about 800,000 bales; and as to quality, no State produces a better article. She almost makes a monopoly of the sea-island or long-staple crop. With the exception of a very restricted area in South Carolina and Florida, Georgia may be said to be the exclusive producer of this valuable and eagerly-sought variety. By large odds, it is probable that Georgia exceeds any other State in the extent of area she possesses which is well adapted to the production of the black-seed cotton. In all the counties of the State coterminous with the extreme southern tier adjoining Florida, we have a surface of about ten thousand square miles well adapted to the production of the long-staple cotton, and of a high grade. The

yield, where proper skill and care are exercised, is about equal to the crop of short staple. Now, the roller gins, which heretofore, by their slow performance, added so much to the care and cost called for in the preparation of this crop, are about to be superseded by better machines and of speedier movement, we may reasonably expect a strong impulse to be given to the cultivation of long-staple cotton. The price of this desirable fibre is about double that of short cottons, and often even more than double. On the coast lands short cotton may be raised to great advantage, and the tendency of the growth seems to be towards a longer and improved fibre. From the coast to a line drawn across the State just below the mountain range, cotton is cultivated, and some fear to see such a point of success as to draw off the attention of the farmers of that section of the State from a culture of such staples as would contribute a greater sum to the comfort and prosperity of the community. We refrain from giving the cost of cotton production, as that depends so largely on conditions which constantly vary. In a vast number of instances cotton culture may be said to result in a most encouraging net profit in most of the sections of the State producing that staple where the question of labor does not intervene under its more unfavorable aspects. Where the farmer in Georgia owns his land and he and his family supply the labor that produces the crop, it is highly probable that more clear money is now realized from cotton at present prices and the improved culture practiced, than at any previous time in the history of our agriculture. Loss comes only to the man who depends on hiring labor, badly organized and controlled, and supported by purchased supplies.

The yield per acre is from 140 pounds of lint to 450. One bale to the acre, under present improved methods, is not at all an unusual crop, and as high as five bales to a single acre have been produced on upland, and sixteen bales on a patch of four acres. It is not an empty boast to claim for Georgia that her farmers and planters are pushing with unusual vigor and intelligence, methods and inquiries which promise to make her a leading authority in all matters pertaining to cotton production.

We subjoin some well-authenticated returns, made chiefly to the

Department of Agriculture of the State, which give a possible result in the capacity of the soil of Georgia in the production of our leading staples. These examples of good culture, while they are certainly better than the successes of the ordinary and slipshod tillage of the State, are at the same time not of abnormal or difficult achievement. These instances of fine and satisfactory yields illustrate the important fact that Georgia soil and climate respond to the farmers' outlay of money and care, and that a very high per centage may be realized by the man who liberally and intelligently expends money in the yearly operations of his farm. The world is beginning to discover that this is the true secret of success in agricultural ventures. After making reasonable allowance for the miscarriage that follows unfavorable seasons, if the farmer secures a good interest on the money he loans his farm for the year, he should be satisfied. This is business, on business principles, and will always sustain the man who so conducts it.

CAPACITY OF GEORGIA SOIL UNDER HIGH CULTURE.

The various agricultural products common to Georgia having been given with minuteness in the chapter on Soils and Productions, we proceed to give the results of a number of experiments in the cultivation of those products, in each of those divisions, conducted with proper preparation and fertilization—such as are given in the more densely settled portions of the world. As but little is accomplished by inadequate means in any department of human industry, the actual producing capacity of a country can only be tested by the results of *judicious* culture. The crops, to which we shall refer, were reported to the various State and county fairs within the past few years, and both the culture and its results were verified by the affidavits of disinterested parties.

In 1873, Mr. R. H. Hardaway produced on upland, in Thomas county (Lower Georgia), 119 bushels of Indian corn on one acre, which yielded a net profit of \$77.17.

In the same county, the same year, Mr. E. T. Davis produced 96½ bushels of rust-proof oats per acre. After the oats were harvested he planted the same land in cotton, and in the fall gathered 800 pounds of seed cotton.

Mr. John J. Parker, of the same county, produced, in 1874, on one acre, 694½ gallons of cane syrup, at a cost of \$77.50. The syrup, at 75 cents per gallon, the market price, brought \$520.87—net profit from one acre, \$443.37.

In 1874, Mr. Wiley W. Groover, of Brooks county (Lower Georgia), produced, with two horses, on a farm of 126½ acres, without the aid of commercial fertilizers, cotton, corn, oats, peas, sugar cane and potatoes to the value of \$3,258.25. The total cost of production was \$1,045.00, leaving net proceeds of crop \$2,213.25. The stock raised on the farm was not counted.

Joseph Hodges, of the same county, produced, on one acre, 2,700 pounds of seed cotton; Wm. Borden, 600 gallons of syrup; J. Bower, 500 bushels of sweet potatoes; J. O. Morton, 75 bushels oats; Mr. T. W. Jones made 12 barrels, or 480 gallons of syrup on one acre, and saved enough cane for seed.

In Bulloch county (Lower Georgia), 3,500 pound of seed cotton were produced by Samuel Groover; and in the same county, 21 barrels of sugar at one time, and 700 gallons of syrup at another per acre.

In Clay county, Mr. — Hodge produced from one acre, a few years ago, 4,500 pounds of seed cotton.

Mr. J. R. Respass, of Schley county, gathered the present year (1878) a little upwards of 500 bushels of oats from five acres.

Mr. J. R. Respass, of Schley county (Lower Georgia), in 1877, by the use of fertilizers, grew on five acres of naturally poor land, 15,000 pounds of seed cotton, which netted him when sold, \$66.02 per acre.

Mr. H. T. Peeples, of Berrien county, reports to this Department a crop of 800 bushels of sweet potatoes grown on one acre of pine land.

In 1876, Mr. G. J. Drake, of Spalding county (Middle Georgia), produced 74 bushels of corn on one acre of land.

Mr. John Bonner, of Carroll county, made three bales of cotton (500 pounds each) on one acre. Mr. R. H. Springer, of the same county, produced nine bales from five acres, without manures, and ninety-four bales from 100 acres by the use of fertilizers.

In 1873 Mr. S. W. Leak, of the same county produced on one

acre 40 $\frac{1}{2}$ bushels of wheat, worth \$80.50; cost \$14.50—net profit \$66.00.

In Wilkes county 123 bushels of corn were produced on one acre of bottom land; also 42 bushels of Irish potatoes on one-tenth of an acre, the second crop same year on same land, the second crop very fine, but not so good.

Mr. J. F. Madden, of the same county, produced in 1876, on one acre, 137 bushels of oats.

Mr. T. C. Warthen, of Washington county (on the line of Middle and Lower Georgia), produced in 1873, on 1.1125 acres, 6,917 pounds of seed cotton, equivalent to five bales of 461 pounds each, worth, at 17 $\frac{1}{2}$ cents per pound—the average price of that year—\$403.37. The cost of culture was \$148.58; net profit \$254.79 for a very small fraction over one acre.

Dr. Wm. Jones, of Burke county, produced 480 gallons of syrup on one acre. Wesley Jones, of the same county, produced three bales of cotton, 500 pounds each, per acre. Jas. J. Davis, in the same county, made, in 1877, with two mules, thirty-four bales of cotton, 500 pounds each, 600 bushels of corn, and 300 bushels of oats. Wm. C. Palmer, of same county, made in 1877, with one mule, twenty-five bales of cotton, 500 pounds each, and a fair crop of corn. Henry Miller, of same county, produced, in 1877, sixty-five bushels of corn per acre, first year, on reclaimed swamp, without manure.

Mr. R. M. Brooks, of Pike county (Middle Georgia), produced, in 1873, on five acres of bottom land, 500 bushels of rice. The total cost was \$75—net profit \$300.

Mr. R. B. Baxter, of Hancock county (Middle Georgia), in 1872, harvested at the first cutting, first year's crop, 4,862 pounds of dry clover hay per acre.

Mr. A. J. Preston, of Crawford county, gathered from one acre of Flint River bottom, 4,000 pounds of seed cotton, and from another on same place 115 bushels of corn.

Dr. T. P. Janes, of Greene county (Middle Georgia), produced, in 1871, five tons of clover hay per acre, in one season, at two cuttings.

Mr. Patrick Long, of Bibb county (on the line of Middle and

Lower Georgia), harvested from one acre of land, from which he had gathered a crop of cabbages in June of the same year, 8,646 pounds of native crab grass hay.

Mr. S. W. Leak, in Spalding county (Middle Georgia), gathered in the fall of 1873, from one acre, from which he had harvested forty bushels of wheat in June, 10,720 pounds of pea-vine hay. Net profit from wheat, \$66; from pea-vine hay, \$233.08, making in one year, from a single acre, a net profit of \$299.08.

Mr. William Smith, of Coweta county (Middle Georgia), produced 2,200 pounds of seed cotton per acre on ten acres.

Mr. Edward Camp, of the same county, produced 1,000 bushels of oats from ten acres.

Mr. J. T. Manley, of Spalding county (Middle Georgia), produced 115 bushels of oats from one acre.

Mr. S. W. Bloodworth, of the same county, gathered, in 1870, 137 bushels of corn from one acre.

Mr. L. B. Willis, in Greene county (Middle Georgia), in June, 1873, from one acre and a third, harvested twenty bushels of wheat, and the following October 27,130 pounds of corn forage. From the forage alone he received a profit of \$159.22 per acre.

Dr. W. Moody, of the same county, harvested at one cutting, from one acre of river bottom, in 1874, 13,953 pounds of Bermuda grass hay; cost \$12.87, value of hay \$209.29, net profit \$196.42.

Mr. J. R. Winters, of Cobb county (Upper Georgia), produced, in 1873, from 1.15 acres, 6,575 pounds of dry clover hay at the first cutting of the second year's crop.

Mr. T. H. Moore, of the same county, produced on one acre, 105 bushels of corn, while Mr. Jeremiah Daniel produced 125 bushels.

Mr. R. Peters, Jr., of Gordon county (Upper Georgia), harvested in 1874, from three acres of lucern, four years old, fourteen tons and 200 pounds of hay, or 9,400 pounds per acre.

Capt. C. W. Howard produced, on Lookout Mountain, in Walker county (Upper Georgia), in 1874, on one acre of unmanured land, which cost him twenty-five cents per acre, with one hoeing and plowing, 108½ bushels of Irish potatoes, which he sold in Atlanta

at a net profit of \$97.25. On land manured, and better prepared and worked, double that quantity could be produced.

Mr. Thomas Smith, of Cherokee county, produced 104 bushels of corn from one acre.

Mr. John Dyer, of Bibb county, produced in 1873, from one acre, at a cost of \$8, 398.7 bushels of sweet potatoes, which he sold at a net profit of \$290.92.

Mr. Haddon P. Redding, of Fulton county, in 1877, produced from one acre 400 bushels of St. Domingo yam potatoes, which he readily sold in Atlanta at an average of \$1 per bushel.

We add the award made upon the returns of a number of contestants for the crop of 1884, which it is seen presents Georgia Agriculture in a most favorable light. The summary is taken from the *Atlanta Constitution*, Dec. 13, 1884, and is attested by names of the highest authority :

[From The Atlanta Constitution.]

FARMING THAT PAYS.

What one hundred Georgia Farmers have done. Four Bales of Cotton and 116 1-2 Bushels of Corn to the Acre—A Roll of Honor—The Contestants for the Premiums of George W. Scott & Co.—Some Anti-Texas Arguments.

We print herewith a list that should make every Georgian proud of Georgia.

Messrs. George W. Scott & Co., of this city, manufacturers of Gossypium-Phospho, the Cotton and Corn Fertilizer, offered prizes for the best acres of corn and cotton grown with their fertilizer. The result was an astonishing one. Over 100 farmers in different sections of the State contested, and sent in their returns properly sworn to and attested.

There were 75 farmers who planted cotton. They averaged 774 pounds of lint cotton to the acre, with \$15 an acre spent for fertilizer. The highest yield was 1,545 pounds to the acre, or practically 4 bales to the acre of 400 pounds each. There were 16 corn planters, who made an average of 81 bushels to the acre—the highest yield being 116 1-2 bushels,

These results cannot be beaten anywhere. A sturdy old farmer came into Mr. Scott's office yesterday, and said :

"Well, Mr. Scott, I have read about your premiums. I read it to my boys, and it 'hoped them up' mightily. They had been getting restless on the old farm, and had talked about going off. But when they saw that a hundred Georgia farmers had made nearly two bales to the acre, scattered all about the State, they made up their minds to stay with me on the old farm, and to make it themselves."

Every farmer in the South ought to read this list, and make up his mind to do as the old farmer's boys have done. Here is the list :

The five successful contestants made an average of 1,355 2-5 pounds of lint cotton per acre, and used an average of 987 pounds of Gossypium.

The corn premiums show just as gratifying results. There were sixteen contestants and the average yield was eighty-one bushels to the acre. The first premium was taken with 116½ bushels and the last premium with 103 bushels. These results are gratifying. Taken with the cotton yield they show that the farmers of Georgia are making rapid progress. We doubt if ever before a hundred farmers in the State could have made up such an average. It shows that they are rapidly coming to the intensive system in farming. It shows that they are abandoning the loose, old plantation methods, and are beginning to see the profit and comfort in small farms well tilled.

[From The Atlanta Constitution.]

ONE HUNDRED GEORGIA FARMERS.

The most encouraging news we have printed for many a day was the record of the contests for the gossypium phospho premiums, which appeared yesterday. A home company manufactures a fertilizer. It offers \$800 in gold for the best yield made on ground enriched with that fertilizer, and four Jersey bulls for the best yield made by clubs. So that the competition has the effect of a fair.

There were seventy-five farmers who contested for the cotton premium according to the rules. The highest yield was 1,545 pounds of lint cotton to the acre, or 3 1-2 bales of 450 pounds each.

The lowest yield was 430 pounds, or a bale to the acre. The average of the seventy-five farmers was 774 pounds, or nearly two bales to the acre. To secure this yield he used an average of 888 pounds of gossypium, which cost at his depot, \$15.54. At nine cents his cotton brought \$69.66. Deduct from this the cost of the fertilizer and we have \$54.12 net profit to the acre. The fifty bushels of cotton seed from each acre will about pay for the cultivation. At a bale to the acre above the cost of the fertilizer, any farmer can get rich. Here are seventy-five farmers who have more than made that average. The returns show that throughout the entire State, 850 000 bales of cotton were raised on 3,100,000 acres, or less than one bale to $3\frac{1}{2}$ acres. So that the average farmer of Georgia prepares, plants and cultivates seven acres and gets from that large surface just what these seventy-five farmers average from one acre.

The committee say: We have carefully examined all the papers submitted in each case, and were governed by the rules prescribed in your published circular. We regret to say that several contestants were ruled out for non-compliance with the rules, and who would otherwise have been entitled to premiums. We note especially that the contestant reporting the greatest yield on a single acre was ruled out for non-compliance. You have the reports of all the contestants in your hands, and, of course, will make such use of them as you think proper. Very respectfully,

J. T. HENDERSON, *Chairman*,
WM. M. PHILLIPS,
L. F. LIVINGSTON,
E. L. THOMAS,
R. J. REDDING,

Committee of Awards.

Atlanta, Ga., December 13, 1884-5.

WHAT GEORGIA CAN DO IN THE RAISING OF SMALL GRAIN.

As supplemental to exhibits made by the cotton raisers of Georgia, an account of a contest for premiums on wheat and oats is subjoined. When the yield here recorded, and upon the highest testimony, is considered, and then the superior market for this grain over the prices ruling in the marts in which Western grain must be sold, it will be readily believed that grain raising in Georgia leads by a long distance the profits of the Western grower.

We quote from the *Atlanta Constitution*, of August 4, 1885 :

"In December last we had the pleasure of publishing the report of the committee appointed by the contestants to award the premiums offered by Geo. W. Scott & Co., of this city, for the largest yields of cotton and corn where *Gossypium Phospho* only was used as a fertilizer. As will be remembered, the results of the contests, as given by this committee, headed by the Commissioner of Agriculture for Georgia, astonished the whole country, and must have been very gratifying to the manufacturers of this well known fertilizer. We now have the report of the committee who were charged with the duty of making the award of premiums offered by the same parties for the best yield of wheat and oats under the same conditions.

The most remarkable and interesting feature of the contest is the yield of oats on land fertilized last year with *Gossypium* only, and planted in corn or cotton last year and sown in oats this season, and without the use of any additional fertilizer or manure being used this year, made an average yield of one hundred and eight bushels of oats to the acre, showing conclusively that *Gossypium* greatly benefits the crops into the second season.

The following is the report of the committee who were selected by the parties contesting for the premiums :

ATLANTA, GA., July 18, 1885.

MESSRS. GEO. W. SCOTT & Co, Atlanta, Ga. :

Gentlemen—The undersigned beg to submit the following report of the results of the contests for the premiums offered by you for the largest yield of wheat and oats, on one acre of land, respectively, by the use of your *Gossypium Phospho* only.

BEST YIELD OF WHEAT.

First Premium, \$100, awarded to B. F. Hudgins, Decatur post-office, DeKalb county, Ga. Yield 64.95 bushels wheat. Used 600 pounds Gossypium and no other manure.

Second Premium, \$50, awarded to S. N. Rucker, Alpharetta post-office, Milton county, Ga. Yield 28.25 bushels wheat. Used 1,000 pounds Gossypium and no other manure.

Third Premium, 1 ton Gossypium, awarded to T. N. Delaney, Woodstock post-office, Cherokee county, Ga. Yield 28 bushels wheat. Used 600 pounds Gossypium and no other manure.

BEST YIELD OF OATS.

First Premium, \$100, awarded to Jeffry Hudgins, Decatur post-office, DeKalb county, Ga. Yield 131.77 bushels oats. Used 500 pounds Gossypium and no other manure.

Second Premium, \$50, awarded to A. P. Redmon, Rome post-office, Floyd county, Ga. Yield 121.40 bushels oats. Used 400 pounds Gossypium and no other manure.

Third Premium, one ton Gossypium, awarded to L. B. Tolon, Jonesboro, Clayton county, Ga. Yield 86 bushels oats. Used 400 pounds Gossypium and no other manure.

BEST YIELD OF OATS

Made on one acre of land, planted in corn or cotton, season 1884, on which Gossypium only was used, and on which no additional manure or fertilizer was used this season.

First Premium, \$100.00, awarded to B. F. Hudgins, Decatur P. O., DeKalb county, Georgia. Yield 129.81 bushels oats. Planted in cotton season 1884, and 835 lbs. Gossypium used and made 1,263 lbs. lint cotton. No fertilizer or manure used this season.

Second Premium, \$50.000, awarded to A. P. Redmon, Rome post-office, Floyd county, Ga. Yield, 114.65 bushels oats. Used 200 pounds Gossypium, 1884. No fertilizer or manure used this season.

Third Premium, one ton Gossypium, awarded to W. L. Huff, Bellevue, Talbot county, Georgia. Yield, 80.60 bushels oats. Used 375 pounds Gossypium, 1884. No fertilizer or manure used this season.

The reports were made out in substantial compliance with your printed instructions and blanks, and were considered on their merits. The details of all the tests are herewith submitted.

J. T. HENDERSON,
Chairman,
J. J. TOON,
W. P. ROBINSON,
R. J. REDDING,
B. H. VAUGHN,
Committee.

APPENDIX.

[The following information was not received in time for insertion in the body of the work.]

METHODIST EPISCOPAL CHURCH.—In January, 1866, Bishop Clark, of Cincinnati, with 10 ministers, all white, organized this church in Georgia, at Atlanta. Nearly all the members then enrolled were white. In 1876, it was found expedient to erect two separate conferences, coterminous in territory, each embracing the State, the *Georgia Conference*, including the white membership, and the *Savannah Conference*, composed chiefly of colored members. The following are the official statistics for the year 1884 :

| | <i>Conferences.</i> | |
|-------------------------------|---------------------|-----------|
| | Georgia. | Savannah. |
| Ordained Ministers..... | 29 | 82 |
| Communicants..... | 3,033 | 15,422 |
| Church Edifices..... | 74 | 174 |
| Value of Church Edifices..... | \$40,525 | \$130,170 |
| Sunday-schools..... | 53 | 181 |
| Officers and Teachers..... | 288 | 941 |
| Pupils..... | 2,170 | 9,989 |

Of institutions of learning the Georgia Conference has one seminary of high grade, each, at Ellijay, Gilmer county ; Mt. Zion, Carroll county ; and Stockbridge, Henry county.

The Savannah Conference one seminary, each, at LaGrange and Waynesboro ; and the Woman's Home Missionary Society have established an Industrial School at Savannah.

ZION METHODIST CHURCH (COLORED).—All efforts have failed to secure any official statistics of this church.



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